

No. 812,264.

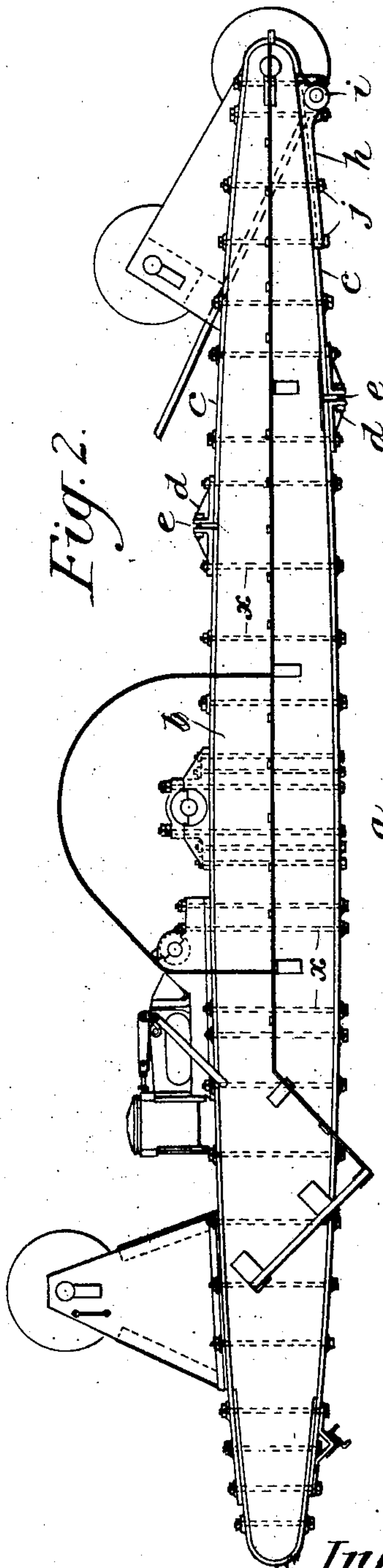
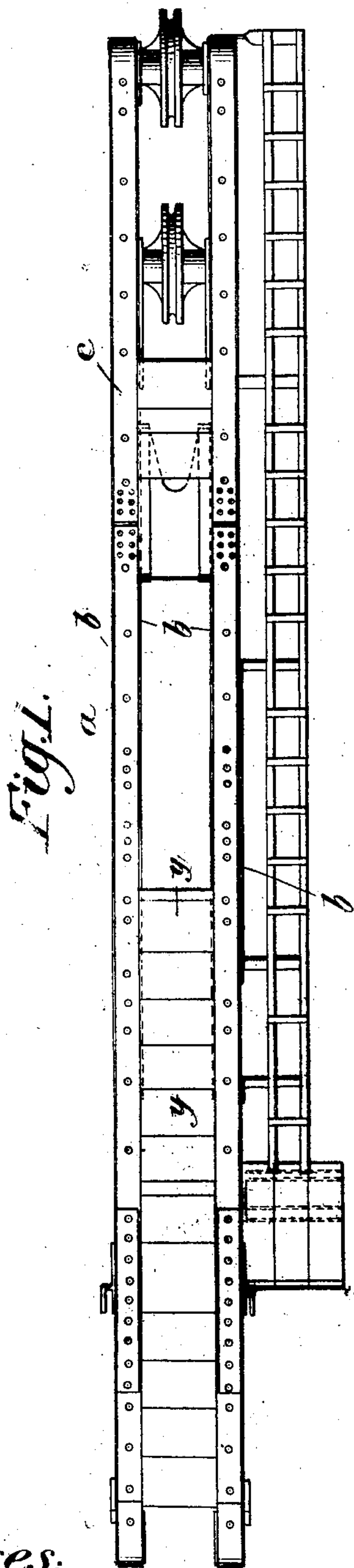
PATENTED FEB. 13, 1906.

W. FERRIS.

COMPOSITE BOOM FOR STEAM SHOVELS AND THE LIKE.

APPLICATION FILED JUNE 10, 1905.

2 SHEETS—SHEET 1.



Witnesses:  
D. W. Edeline  
R. H. Smith

Inventor:  
Walter Ferris  
by Lemuel & Goldsborough  
attys

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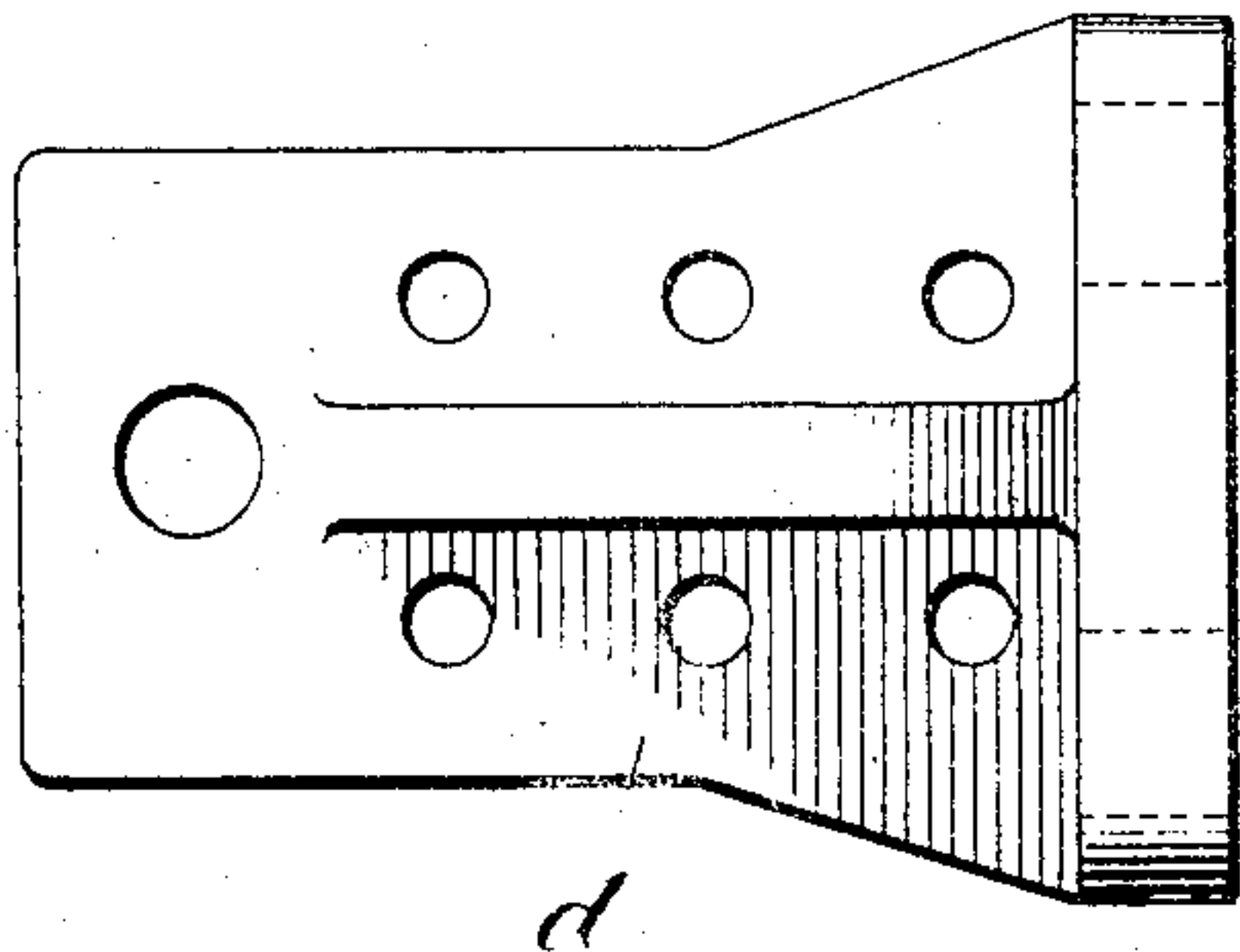
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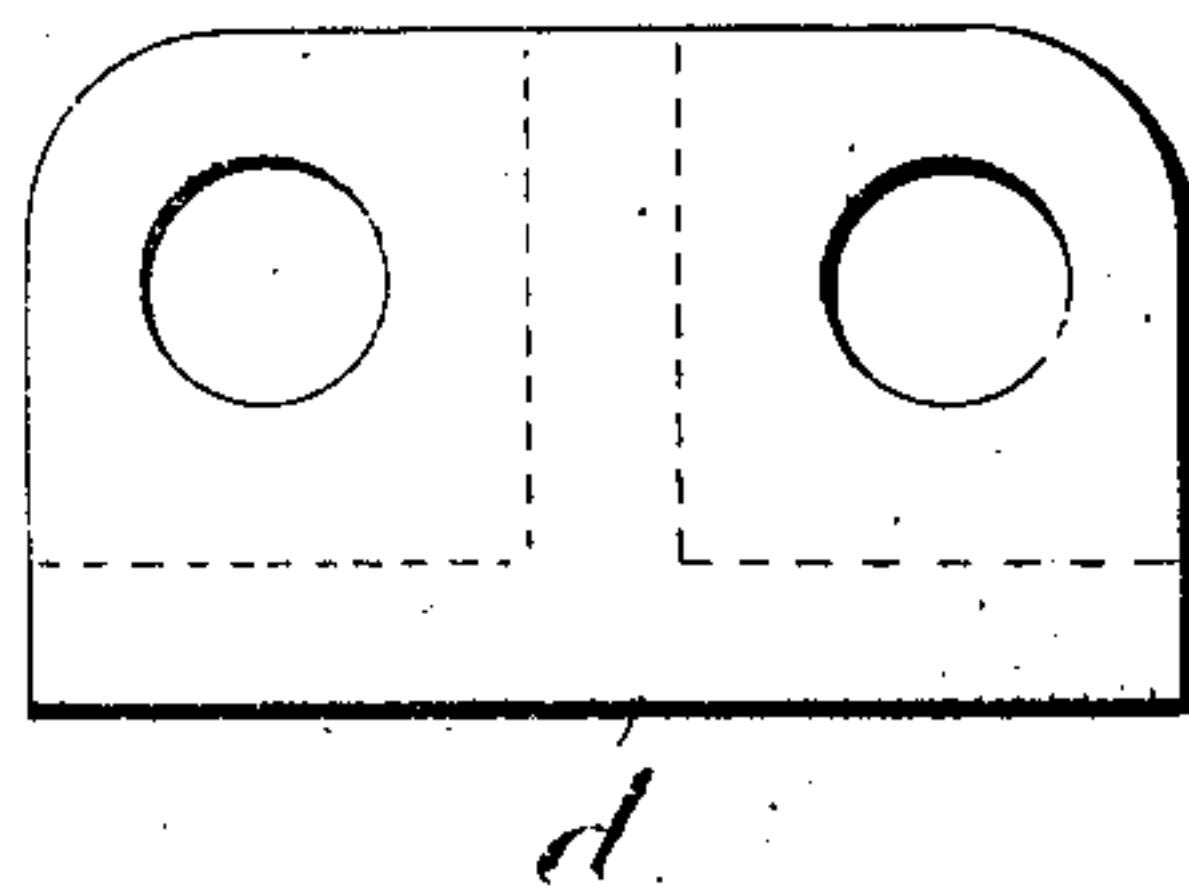
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2 SHEETS—SHEET 2.

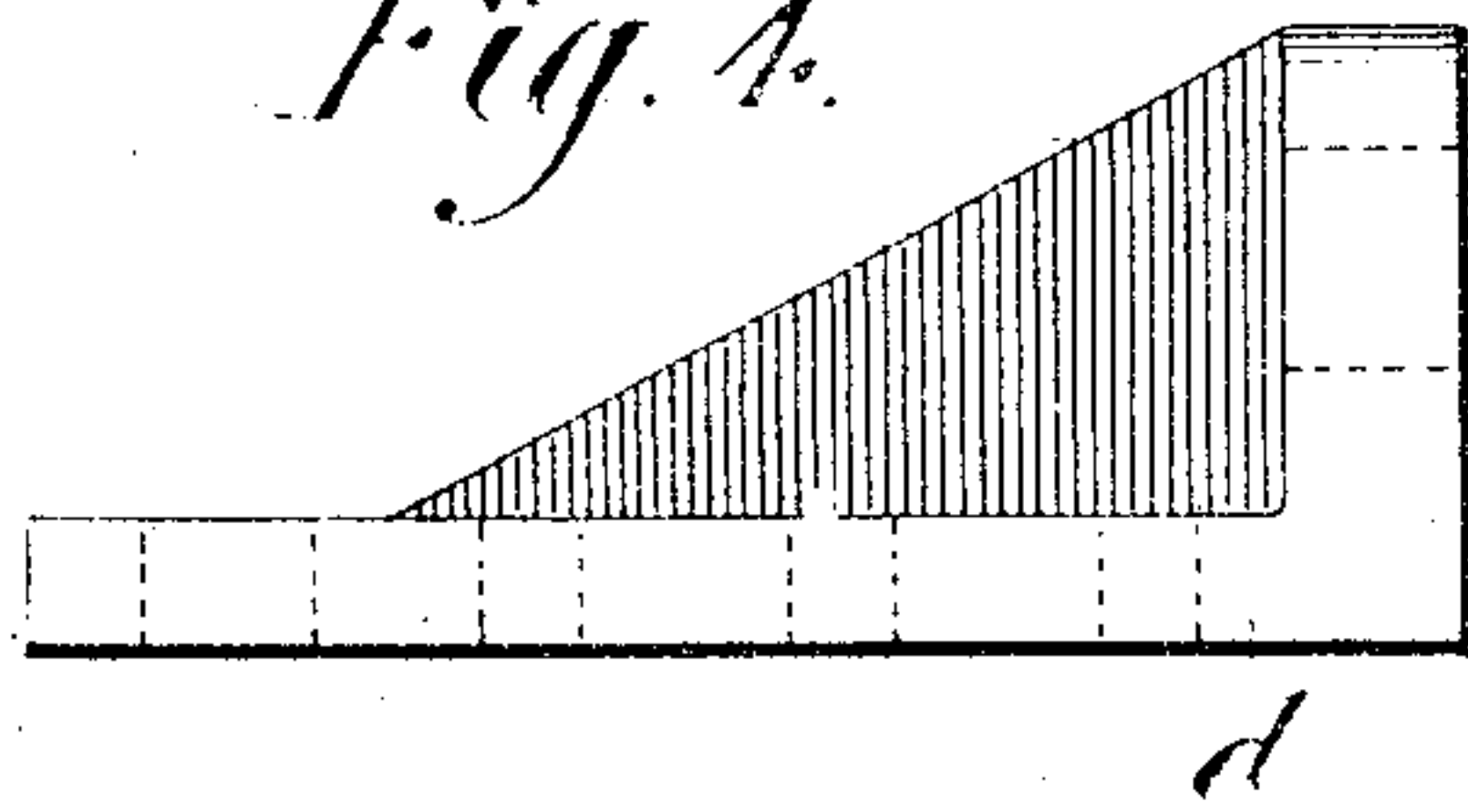
*Fig. 3.*



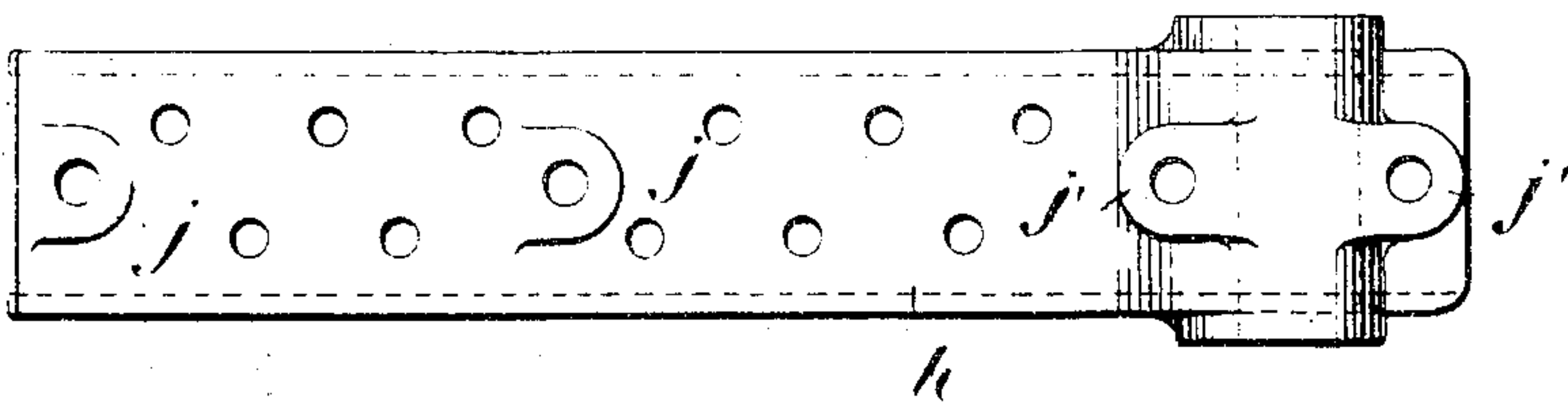
*Fig. 5.*



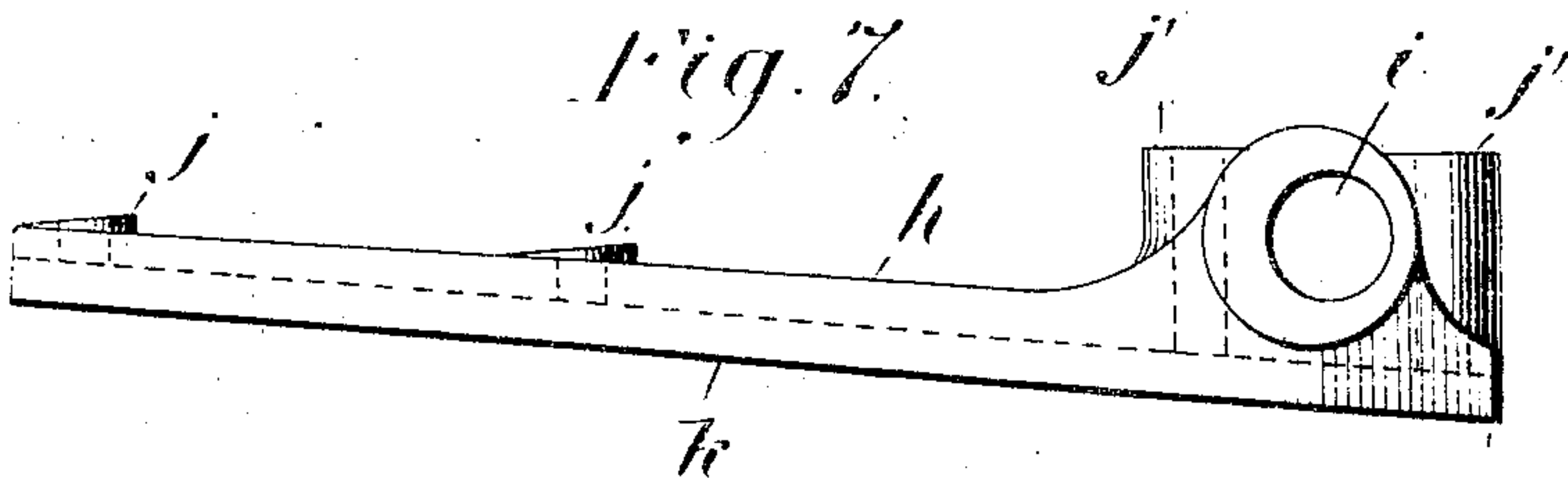
*Fig. 4.*



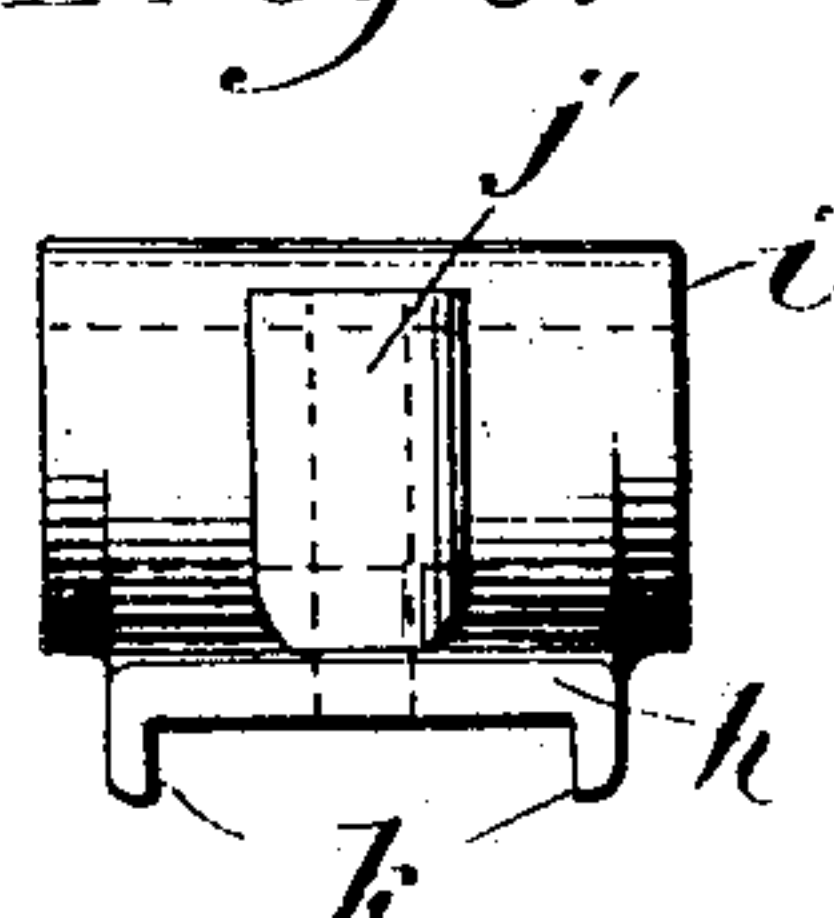
*Fig. 6.*



*Fig. 7.*



*Fig. 8.*



Witnesses:  
D. W. Edeline.  
R. C. Hunt.

Inventor:  
Walter Ferris.  
By *James Goldborough*  
Attys



# UNITED STATES PATENT OFFICE.

WALTER FERRIS, OF SOUTH MILWAUKEE, WISCONSIN, ASSIGNOR TO THE BUCYRUS COMPANY, OF SOUTH MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

## COMPOSITE BOOM FOR STEAM-SHOVELS AND THE LIKE.

No. 812,264.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed June 10, 1905. Serial No. 264,663.

*To all whom it may concern:*

Be it known that I, WALTER FERRIS, a citizen of the United States, residing at South Milwaukee, county of Milwaukee, Wisconsin, have invented certain new and useful Improvements in Composite Booms for Steam-Shovels and the Like; 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.

My invention relates to composite booms for steam shovels, excavators, and the like, and has for its object to provide means for applying the edge strip or binder accurately to the wood filler and for compensating the shrinkage of the wood and the expansion of the metal, together with a boom-stay connection at the end of the boom attached to the edge strip and engaging the side plates, thereby serving to distribute the bending strains to all parts of the composite structure and also to materially strengthen the boom at the point of greatest strain—viz., just below the point-sheave.

To this end the invention comprises a boom having a core or filling of wood with metal side plates bolted thereto, an edge strip or binder provided with means for drawing or adjusting the ends of the binder toward each other to cause the binder to closely hug the periphery of the wood filling when the parts of the boom are assembled in the first instance and also to draw up the binder tightly on the filling when the latter shrinks after the boom is put in service, and a lug forming the outward attachment for the boom-guy, which lug is securely fastened to the edge strip or binder and also to the wood filling at a point just below the bearing of the point-sheave, said lug having a rearwardly-extending strap to afford an efficient connection with the edge strip and also having upwardly-extending side flanges to engage and support the edges of the side plates.

In the accompanying drawings, Figure 1 is a plan view of a steam-shovel boom embodying my invention. Fig. 2 is a side elevation thereof. Figs. 3, 4, and 5 are enlarged detail views of the lugs for connecting the ends of

the edge binder-plates. Figs. 6, 7, and 8 are enlarged detail views of the guy-connecting lugs.

Referring to the drawings, *a* indicates the boom proper, which consists of two longitudinal truss-like members spaced by the usual distance pieces or blocks *y*, each of said longitudinal members comprising an interior filling of wood reinforced by steel side plates *b*, connected to each other and to the wood filling by suitable through-bolts, as will be understood by those skilled in the art to which this invention relates.

Surrounding the edge or periphery of the wood filling within each of the longitudinal members is a steel binder or edge strip, consisting of sectional steel strips or plates *c*, likewise attached to the wood filling by through-bolts. This binder or edgestrip, as indicated, is made in two or more separate parts, and the adjacent ends of the respective parts are provided with bracket-like lugs *d*, which are rigidly secured to the respective plate-sections by rivets and to the wood filling by certain of the through-bolts which pass through the lugs. The vertical ears of the lugs or brackets *d* are perforated to receive stout bolts *e*, carrying suitable nuts, which are turned up, so as to draw the lugs and the ends of the binder-plates toward each other and cause the plates to closely engage the periphery of the wood filling at the time of assembling the parts of the boom and also to compensate for shrinkage of the wood after the boom is put in service. By this means the difficulties frequently encountered in booms of this general type as heretofore constructed, due to the shrinkage of the wood and inability to fit the edge plate to the periphery of the filling when the parts are secured together by through-bolts only are obviated, and by properly adjusting the lugs on the ends of the binder-plates toward each other when applying the binder-plates to the edges of the filler and also when the wood of the filler has shrunk all looseness of fit between the binder and the other elements of the boom is avoided.

As illustrated, the edge binder plate or strip is provided with two sets of adjustable



lugs, one upon the top edge and the other upon the bottom edge, which connect the two sections of the binder which pass around the respective ends of the boom. Under certain circumstances, however, the binder may be made of one strip passing entirely around the boom and adjustably connected by suitable lugs and bolts at its ends, or, if desired, the binder may be applied as a series of sections having their adjacent ends connected by similar adjusting means.

In order to provide a connection for the boom-stay at the outer end of the boom which shall not weaken the latter, but which may be so applied to the boom end as to strengthen and support the edge binder and the side plates and in a measure reinforce the point-sheave bearing where the greatest bending strain is imposed upon the boom, I provide a special casting consisting of a strap-like section *h*, secured to the edge binder *c* near the outer end of the boom, upon which strap-like section there is integrally formed a pin-bearing *i*, adapted to receive the pin or pintle which passes through the eye in the end of the boom-guy. The lateral edges of the strap *h* are provided with upturned flanges *k*, which overlap the edges of the binder *c* and engage the adjacent edges of the side plates *b*, and in the body portion of the strap and the bearing-lug are four or more reinforced bolt-holes to receive a corresponding number of the through-bolts which tie the parts of the boom together. It will thus be seen that the boom-guy-connecting lug serves to strengthen and support the edge binder and the side plates, as well as the point-sheave bearing, at the point where the bending strain is greatest. It will also be noted that in securing the guy-lug to the edge binder-plate and connecting both to the wood filling by means of the through-bolts the casting forming the lug is anchored in an absolutely secure manner and the strain imposed upon the boom at the point of attachment of the guy is distributed to the several elements which go to make up the boom—to wit, the edge binder-plates, the side plates, and the wood filling and the boom adjacent

to the point-sheave bearing where its depth is least is materially strengthened.

Having thus described my invention, what I claim is—

1. In a composite boom having a wood filling, a metal binder around the edge of said filling, and means for adjustably connecting the ends of said binder.

2. In a composite boom having a wood filling, a sectional metal binder around the edges of said filling, and means for adjustably connecting the adjacent ends of the binder-sections.

3. In a composite boom having a wood filling, a metal binder around the edge of said filling, lugs on the ends of said binder and bolts cooperating with said lugs for adjustably connecting the ends of the binder.

4. In a composite boom having a wood filling, sectional metal binding-plates around the edge of said filling, lugs on the ends of the plate-sections, and bolts cooperating with adjacent lugs for adjustably connecting the plates.

5. In a composite boom having a wood filling and metal side and edge plates, a boom-guy lug attached to the under side of the boom, engaging and supporting the side and edge plates.

6. In a composite boom having a wood filling and metal side and edge plates, a boom-guy lug attached to the under side of the boom, engaging and supporting the side and edge plates, said lug comprising a strap having a pin-bearing thereon and vertical flanges along the edges of said strip.

7. In a composite boom having a wood filling and metal side and edge plates, a boom-guy lug comprising a strap riveted to the edge plate below the point-sheave, a pin-bearing on said strap and flanges along the sides of said strap engaging the edges of the side plates.

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

WALTER FERRIS.

Witnesses:

RIDGELY FLETCHER,  
HARRY B. HAYDEN.