(No Model.) 3 Sheets—Sheet 1.

E. J. MULLER.

CONTROLLING MECHANISM FOR CABLE CONVEYERS.

No. 575,367. Patented Jan. 19, 1897.

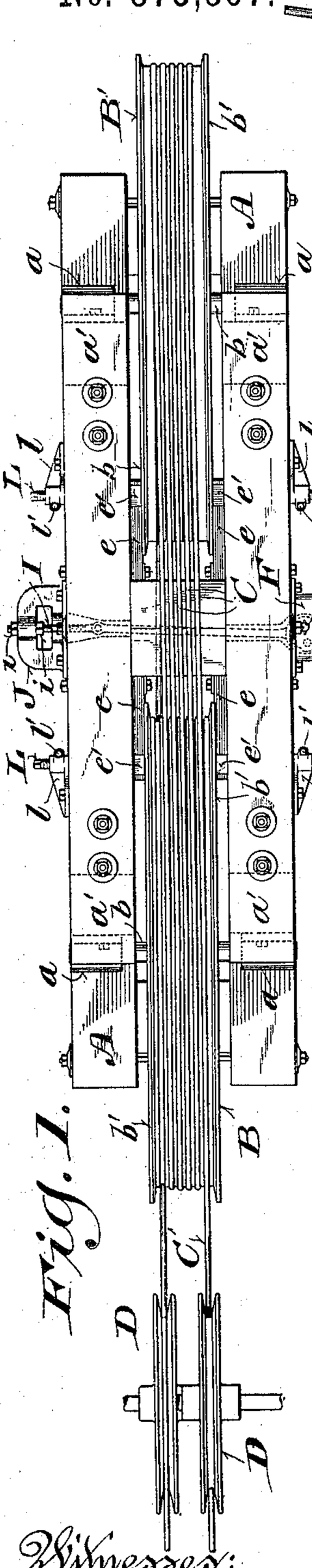

Fig. 1.

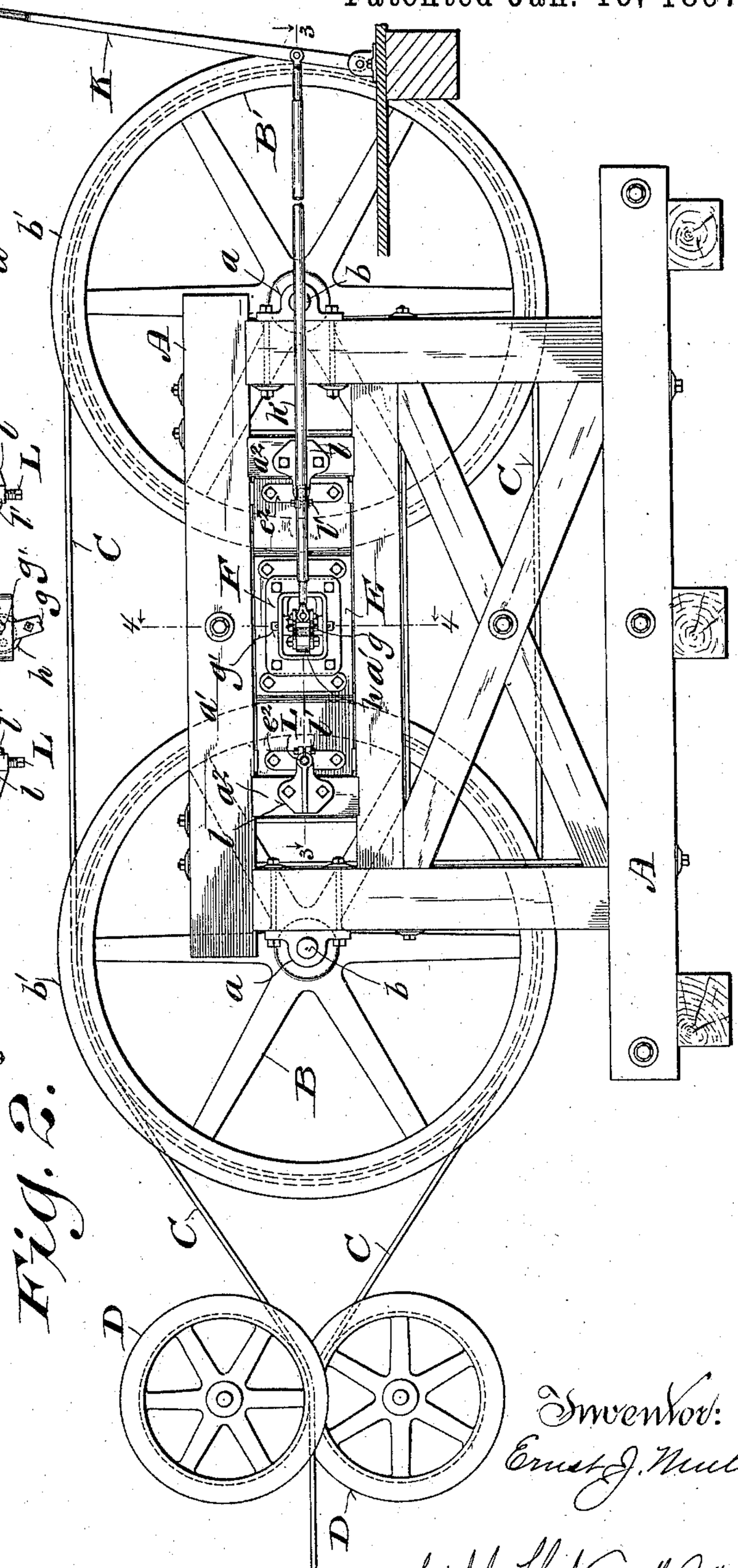

Fig. 2.

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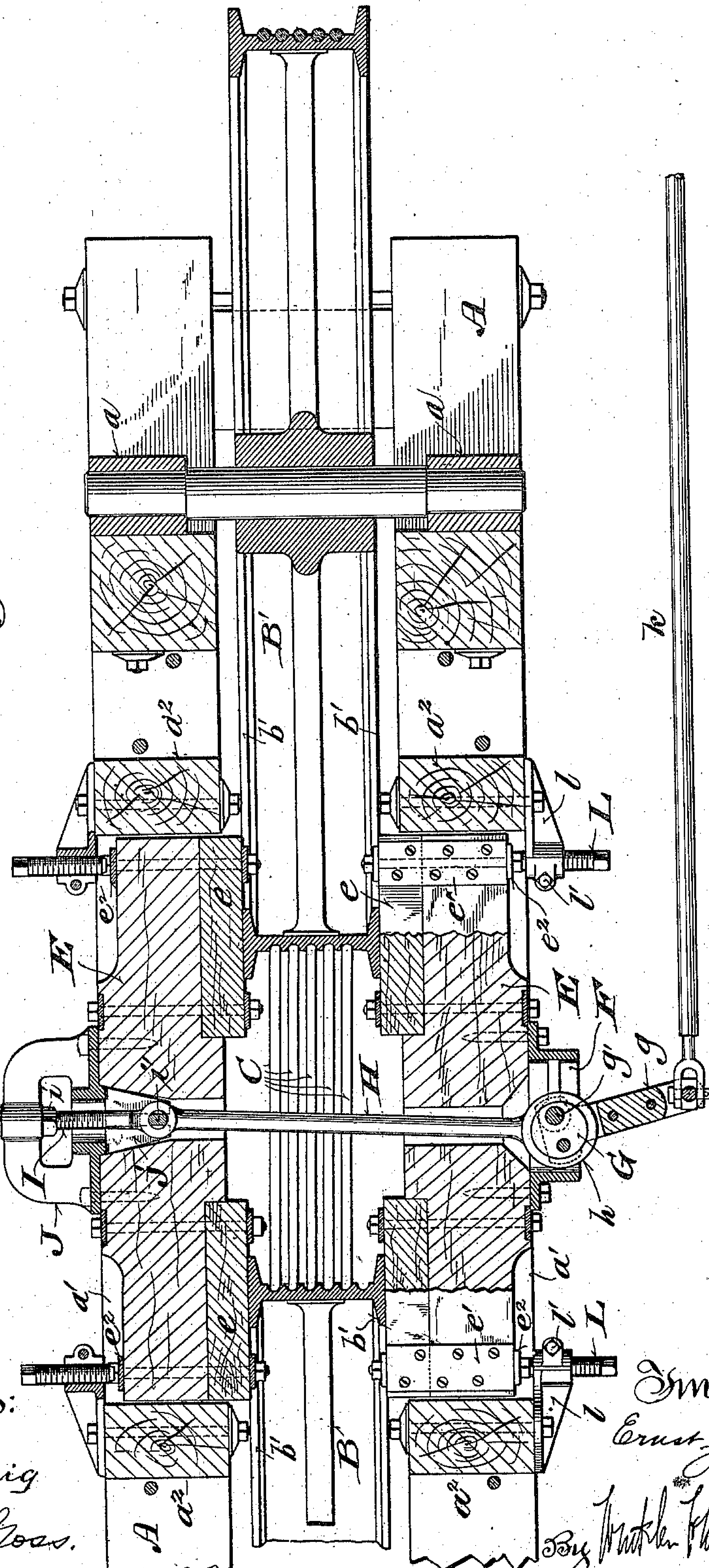
Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

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Fig. 4.

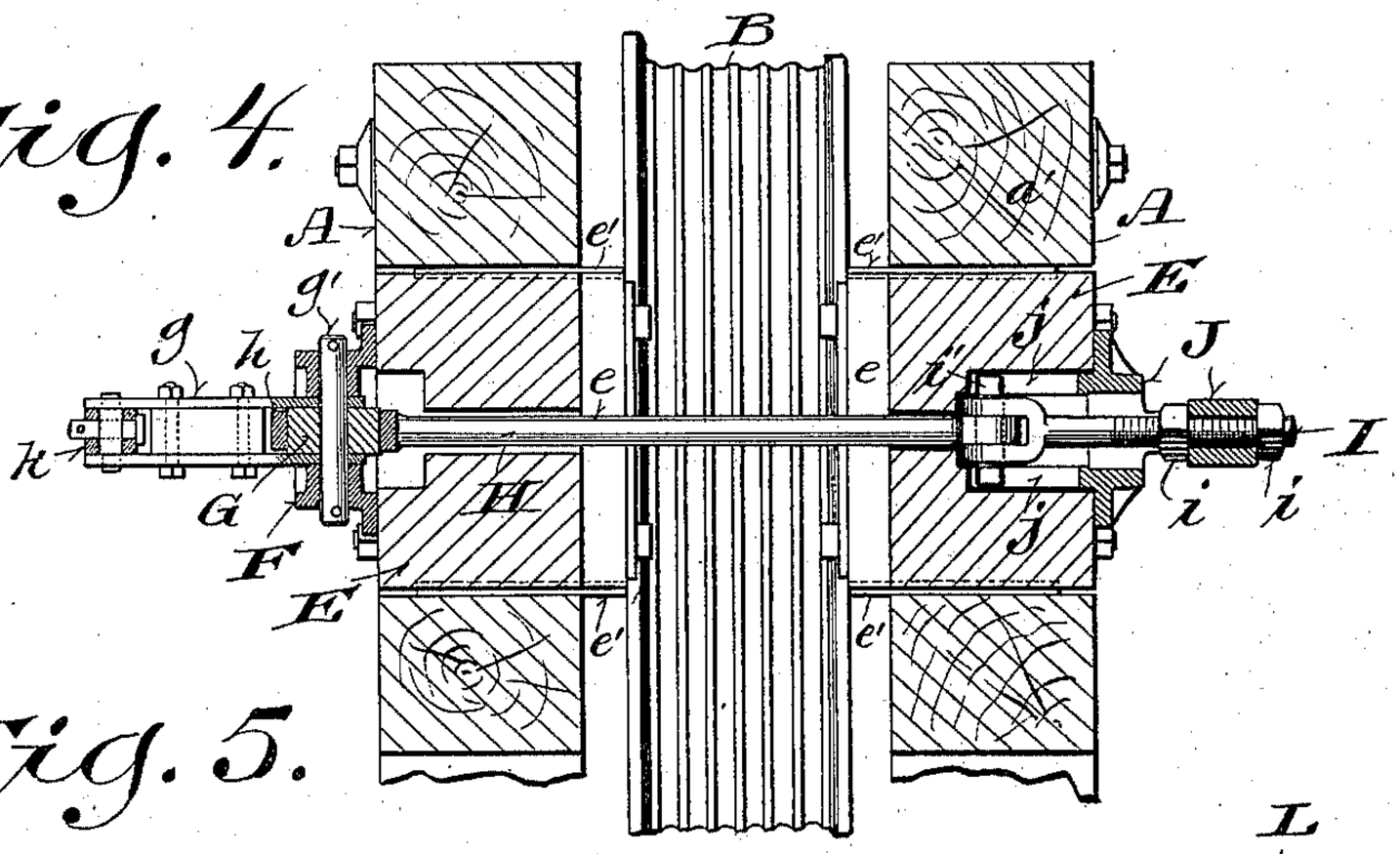
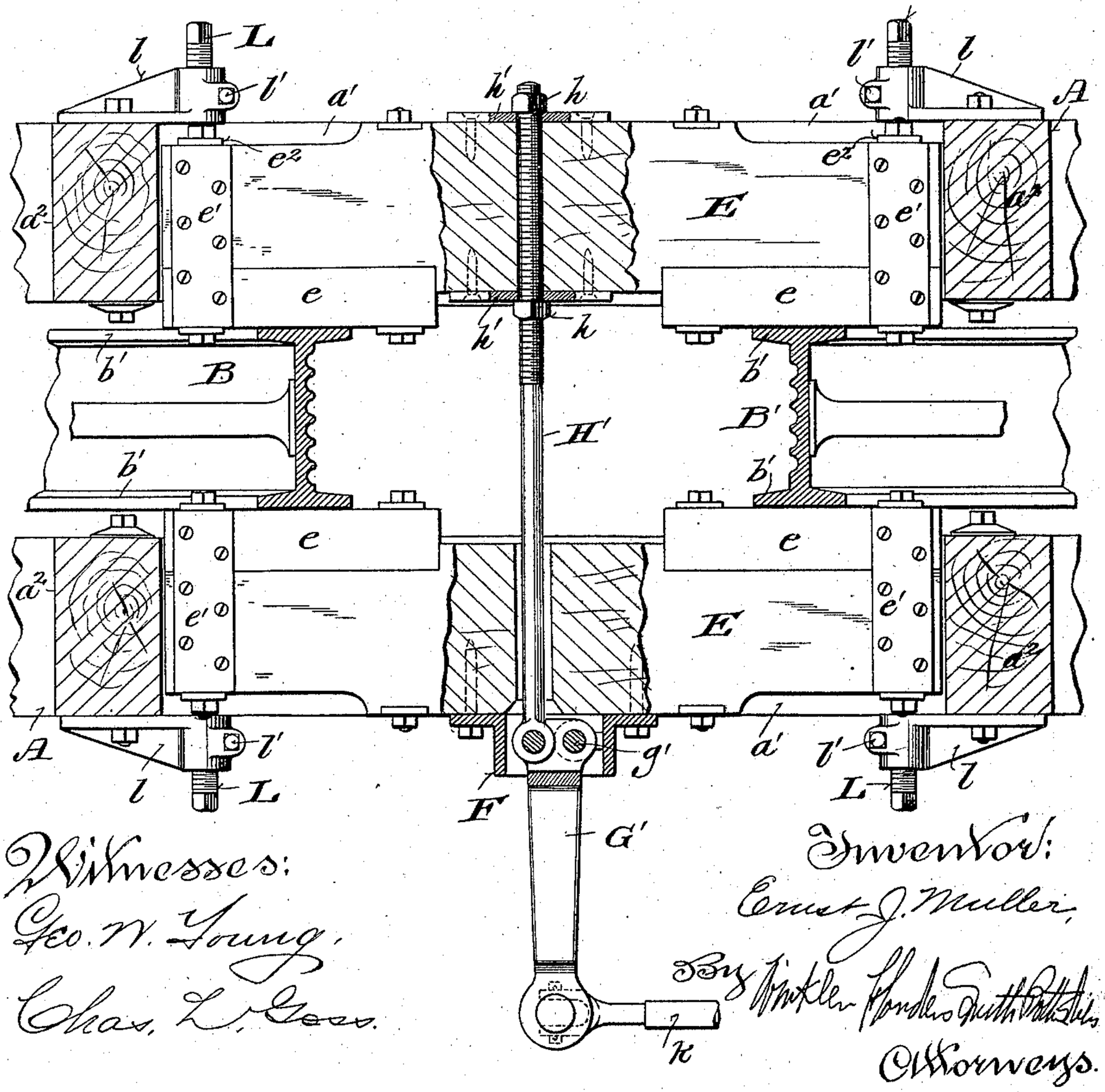


Fig. 5.



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UNITED STATES PATENT OFFICE.

ERNST J. MULLER, OF BUTTE, MONTANA.

CONTROLLING MECHANISM FOR CABLE CONVEYERS.

SPECIFICATION forming part of Letters Patent No. 575,367, dated January 19, 1897.

Application filed December 2, 1895. Serial No. 570,792. (No model.)

To all whom it may concern:

Be it known that I, ERNST J. MULLER, of Butte, in the county of Silver Bow and State of Montana, have invented certain new and useful Improvements in Controlling Mechanism for Cable Conveyers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of conveyers in which a loaded car or bucket running down an inclined way is arranged to draw an empty car or bucket up the way through the medium of an operating-cable passing around one or more spools or drums at the upper end of the conveyer. Its main objects are to control the movements of the cars or buckets, to provide for lengthening the cable without correspondingly increasing the width of face or length of drums, to prevent the application of the brake from causing the drum-shafts to bind in their bearings, and generally to improve the construction and operation of machines of this class.

It consists of certain novel features in the construction and arrangement of component parts of the machine, as hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in the several figures.

Figure 1 is a plan view of a machine embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged horizontal section on the line 3 3, Fig. 2. Fig. 4 is a vertical cross-section on line the 4 4, Fig. 2; and Fig. 5 is a view of a modification of the brake connections, shown partly in plan and partly in horizontal section.

Referring to Figs. 1 to 4, inclusive, A designates the frame of the machine, which is preferably constructed of timber suitably braced and connected by tie-rods, as shown, or it may be made of any other suitable material.

B B′ are spools or drums, the shafts *b b* of which are supported and adapted to turn parallel with each other in boxes *a a*, bolted to the end posts of the frame. These drums are arranged in the same plane with each other and are formed or provided around their peripheries with rims or flanges *b′ b′*, having wide laterally-presented faces for engagement with the brake shoes or blocks.

C designates the operating-cable of the conveyer. It passes upon and off from opposite sides of the drum B, thence around drum B′, thence back around drum B, and thus back and forth from one drum to the other any desired number of times, according to the amount of contact required to prevent the cable from slipping.

I have shown the drum B formed in its periphery with six separate parallel grooves and the drum B′ with five like grooves for guiding the several turns of the cable and preventing them from chafing or rubbing against each other. The two outer grooves of drum B serve simply to guide the cable upon and off from said drum. These grooves may, however, be dispensed with and the peripheries of the drums made plain, with the exception of the outwardly-projecting marginal flanges, which, unless the drums are made with unnecessarily wide faces, would be required to retain the cable thereon.

When the drums are set, as shown, in a vertical position, the cable C is guided to and from the drum B by sheaves D D, by means of which both branches of the cable are held at the same height or level or parallel with each other beyond said sheaves.

I do not wish to be understood as limiting myself to this position of the drums and sheaves, as under certain conditions they might be set horizontally. In this case the sheaves D D would be set vertically with their axes in line with each other.

The movement of the drums and the travel of the cars or buckets attached to the ends of cable C are governed by a brake. This brake consists of two bars or beams E E, which are loosely held and guided between horizontal members *a′ a′* and short uprights a^2 a^2 of the frame A on opposite sides of the drums B B′ transversely to their axes, as clearly shown in Fig. 3. They may be conveniently made of heavy timber, as shown, and provided on their inner sides, adjacent to the rims *b′* of said drums, with shoes or blocks *e e*, of any suitable wearing material that will produce the requisite frictional engagement with said

rims. Upon their upper and under sides and at or near their ends said brake-beams are provided with metallic bearing-plates *e' e'*. To the outer side of one brake-beam is bolted a box or bracket F, in which is pivoted an eccentric G, having an outwardly-projecting arm *g*. This eccentric is adjustably connected by a rod H with the other brake-beam E.

The rod H is formed or provided at one end with a strap *h*, fitted upon said eccentric, and is pivoted at the other end to an eyebolt I, which is adjustably held by nuts *i i* in a bracket J, bolted to the outer side of the adjacent brake-beam. The pivot-pin *i'*, connecting the rod H and eyebolt I, is guided at the ends in forked projections *j* of bracket J. This, as well as the pivot-pin *g'*, on which eccentric G turns, is located midway between the brake-shoes and rims of the drums, so that an equal leverage will be exerted by the connecting-rod H on the shoes at both ends of each brake-beam. The outer end of the eccentric-arm *g* is connected by a rod *k* with a hand-lever K, located within convenient reach of the operator.

It is obvious that the inward movement of the brake-beams toward each other will be limited by the engagement of the shoes *e e* with the rims *b' b'* of the drums. Their outward movement is limited by adjustable stop-screws L L, threaded in brackets *l*, bolted to the short uprights a^2 a^2 of the frame. The threaded sleeves of these brackets, with which the screws L engage, are split and provided with clamping-bolts *l'*, by which they are drawn together tightly upon said screws when the latter have been properly set or adjusted. The brake-beams are provided on their outer sides with metallic plates e^2 e^2, with which the ends of the stop-screws L are adapted to engage.

It will be observed that the brake-beams E E are loosely supported in frame A and within certain limits free to move independently of each other; also that either end of each brake-beam may be moved in either direction, outwardly or inwardly, in advance of the other end. Thus it will be seen that when the brake-shoes *e e* are drawn together and forced against the rims *b' b'* on opposite sides of the drums equal pressure or force will be exerted upon each shoe and through it upon the rims of said drums. The clamping and binding of the drum-shafts in their bearings are thus avoided, and the machine is caused to run smoothly and without unnecessary wear under all conditions.

While one of the brake-beams may be moved into engagement with the rims of the drums in advance of the other, or even one shoe may engage with the opposite rim in advance of all the others, it will exert thereon a pressure just sufficient to bring the other parts of the brake into engagement, and when all the shoes are brought into engagement with the rims of said drums they will exert an equal pressure thereon, as above stated. It is desirable in a machine of this kind that the movement of the brake be as little as practicable in effecting the engagement and disengagement between the shoes and brake-blocks and the rims of the drums. For this reason the adjustable stops are provided to limit the outward movement of the brake-beams. To take up wear on the engaging faces of the brake-shoes and drum-rims, the eyebolt I is drawn outwardly in the bracket J by means of the nuts *i i*, thus bringing the brake-shoes on opposite sides of the drums closer together. The stop-screws L are correspondingly set up or advanced to avoid unnecessary movement of the brake-beams.

Referring to Fig. 5, in place of the eccentric G and its arm *g* I have shown a bell-crank lever G', fulcrumed in the bracket F and connected by its shorter arm by a rod H' with the opposite brake-beam E, through which it passes, being screw-threaded and provided on opposite sides thereof with nuts *h h* for taking up wear on the shoes. The brake-beam is provided on its inner and outer faces with perforated plates *h' h'* for the adjusting-nuts *h h* to bear against. The rod H' springs sufficiently to allow for the slight arc movement of the end connected with lever G'. The lever G' is the equivalent of the eccentric G and its arm *g*, which in effect constitute a lever of the same class.

I do not wish to be understood as limiting myself to the exact details of construction shown and described, as they may be variously modified without departure from the principle and intended scope of my invention.

I claim—

1. In controlling mechanism for cable conveyers, the combination with suitable framework of two rotary drums supported therein and brake shoes or blocks arranged in pairs on opposite sides of said drums and a lever connected therewith and arranged to force said shoes against opposite faces of both drums with the same pressure, substantially as and for the purposes set forth.

2. In controlling mechanism for cable conveyers, the combination with suitable framework of two rotary drums supported therein in the same plane with each other and each having a number of separate parallel grooves in its periphery and lateral friction-faces on both sides, two laterally-movable brake-beams arranged on opposite sides of said drums and provided opposite their friction-faces with shoes or blocks which are adapted to exert the same pressure on opposite sides of both drums when brought into engagement therewith, and a lever having suitable operating connections with said brake-beams, substantially as and for the purposes set forth.

3. In controlling mechanism for cable conveyers, the combination with a suitable frame, of two drums around which the cable passes from one to the other, mounted in said frame in the same plane with each other and having lateral friction-faces, two brake-beams

loosely held and guided in said frame on opposite sides of said drums and transversely to their axes, means of moving said beams laterally toward and from said drums into and out of engagement with the lateral faces of said drums, and stops for limiting the outward movement of said beams, substantially as and for the purposes set forth.

4. In controlling mechanism for cable conveyers, the combination with a suitable frame, of two drums around which the cable passes from one to the other, mounted in said frame in the same plane with each other and having lateral friction-faces, two brake-beams loosely supported and guided in said frame on opposite sides of said drums transversely to their axes, a lever fulcrumed to one of the brake-beams and connected with the other midway between their friction-faces so as to move them toward and from each other and equalize their pressure on both sides of the drums, and adjustable stops on the frame arranged to limit the outward movement of said beams, substantially as and for the purposes set forth.

5. In controlling mechanism for cable conveyers, the combination with a suitable frame, of two drums around which the cable passes from one to the other, mounted in said frame in the same plane with each other, two brake-beams loosely held and guided in said frame on opposite sides of said drums, and transversely to their axes, a lever fulcrumed to one of said beams and adjustably connected by a rod with the other between said drums, and adjustable stops on the frame adapted to engage with said beams at or near their outer ends, and to limit their outward movement, substantially as and for the purposes set forth.

6. In controlling mechanism for cable conveyers, the combination with a suitable frame, of two drums around which the cable passes from one to the other, mounted in said frame in the same plane with each other, two brake-beams loosely held and guided in said frame on opposite sides of said drums and transversely to their axes, and provided on their inner sides opposite each other and the rims of the interposed drums, with shoes or blocks adapted to engage with the lateral faces of said rims, a lever fulcrumed to one of said beams and adjustably connected with the other by a rod between said shoes, and adjustable stop-screws threaded in brackets attached to said frame and adapted to limit the outward movement of said beams, substantially as and for the purposes set forth.

7. In controlling mechanism for cable conveyers, the combination with a suitable frame, of two drums around which the cable passes from one to the other, mounted in said frame in the same plane with each other, and having rims with extended lateral faces in planes transverse to the axes of the drums, two brake-beams loosely held and guided in said frame on opposite sides of said drums, transversely to their axes, and provided with shoes or blocks adapted to engage with the lateral faces of said rims, and a lever connected with said beams between said shoes so as to move them toward and from each other, and to equalize the pressure of the shoes on both sides of the drums, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ERNST J. MULLER.

Witnesses:
ERNEST SHULT,
CHAS. L. GOSS.