

N<sup>o</sup> 11,837



A.D. 1903

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Complete Specification Left, 28th Nov., 1903—Accepted, 31st Dec., 1903

PROVISIONAL SPECIFICATION.

Improvements in Bogie Trucks for Rolling Stock.

I, HENRY ALBERT HOY, of Bolton-le-Moors, in the County of Lancaster, Mechanical Engineer, do hereby declare the nature of this invention to be as follows:—

This invention has reference to improvements in the construction of bogies  
5 for rolling stock whereby the load to be carried can be transmitted to the axles  
of the bogie in a more advantageous manner than heretofore and the trans-  
mission of vibration from the axles of the vehicle reduced, the construction  
moreover being specially adapted for use with electric motors.

In a bogie according to this invention, the load directly applied to the bolster  
10 is transmitted through springs to a lower transverse beam that is suspended  
from the bogie frame and this frame is supported through springs by longi-  
tudinal beams that are connected to vertically movable carriers between which  
and the axle boxes on the wheel axles, other springs are interposed, the arrange-  
ment being such that the load is transmitted through three sets of vertical  
15 acting springs.

Bogies according to this invention can be constructed in various forms and  
the springs used therein may be of any of the kinds heretofore commonly  
used, such as coil springs, laminated carriage springs, or india rubber springs,  
or partly of one kind and partly of another.

In one construction, the bogie frame comprises two longitudinal side members  
20 or sole bars of angle section, each provided on its outer side with two horn  
plates with axle box guides and two spring holding brackets and connected  
together by two transverse members or transoms and a top plate. The transoms  
comprise vertical plates of angle section, connected to the sole bars by angle  
25 irons and spaced at a suitable distance apart to accommodate the bolster which  
is placed between them and provided with laterally arranged vertical bearing  
pieces arranged to work between similar vertical bearing pieces on the transoms.

The top plate, which is curved at its opposite end and extended at its sides in  
a longitudinal direction, is formed with a central and two lateral openings  
30 through which respectively extend the bogie centre and lateral bearing pieces  
that are carried by the bolster and upon which the underframe of the vehicle to  
be carried bears and moves in the ordinary way.

The bolster is of box-like section built up of channel iron and plates and is  
supported at its ends upon two pairs of coil springs carried by a transverse  
35 beam that is or may be of channel section and is supported at its ends by longi-  
tudinal bars carried by the lower slotted ends of two pairs of links the upper  
ends of which are jointed to the transoms. The upper and lower ends of  
the springs are arranged to bear directly against bearing plates attached to the  
lower sides of the bolster and transverse beam, and are provided with exten-  
40 sions that enter the coil springs and hold them in position laterally. Each  
of the longitudinal bars that carry the ends of the transverse beam preferably  
engage in vee-shape bearings formed on the under side of the lower bearing  
plates and so arranged that the lower ends of the two pairs of links are spaced  
farther apart than their upper ends, as heretofore usual.

[Price 8d.]

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Extending below each pair of axle boxes at opposite sides of the vehicle, is a longitudinal beam provided with a pair of spring holders, between which and the spring holding brackets on the sole bars of the bogie frame, are placed a pair of coil bearing springs. The ends of each longitudinal beam pass through the lower slotted ends of a pair of inverted stirrup shaped carriers each of which extends upwards between the opposite sides of an axle box and the angle iron guides fixed to the corresponding horn plate, each end of each beam being recessed at its lower side and supported upon a vee-shaped lug or bearing on a yoke piece carried by the slotted lower ends of the corresponding carrier. Between the upper end of each carrier and the top of the corresponding axle box, is placed a coil spring held in place laterally by a socket piece on the carrier and a socket on the top of the axle box. The lower ends of the horn plates at each side of the bogie frame are connected together by a longitudinal rod.

Bogies constructed as hereinbefore described are specially suitable for use as motor bogies for electrically propelled vehicles.

For this purpose the field magnets or casings of each motor may advantageously be each journalled at one end upon one of the wheel axles and supported at the other end by means of lugs bearing upon springs carried by bearing plates held by bolts suspended from the top plate of the bogie, the motor armature being geared to the axle. The springs may conveniently be of the kind known as Spencer's No. 242 rubber concentric cylinders, but other kinds may be used if desired.

As will be obvious, the details of construction of bogies according to this invention can be variously modified.

Bogie trucks constructed as described may be provided with any suitable arrangement of brake apparatus.

Dated this 23rd day of May 1903.

For the Applicant

W. LLOYD WISE  
46 Lincoln's Inn Fields, London, W.C.  
Chartered Patent Agent.

## COMPLETE SPECIFICATION.

**Improvements in Bogie Trucks for Rolling Stock.**

I, HENRY ALBERT HOY, of Bolton-le-Moors, in the County of Lancaster, Mechanical Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

This invention has reference to improvements in the construction of bogie trucks for rolling stock whereby the load to be carried can be transmitted to the axles of the bogie truck in a more advantageous manner than heretofore and the transmission of vibration from the axles of the truck to the body of the vehicle carried thereby can be reduced, the construction moreover being specially adapted for use with electric motors.

In a bogie truck according to this invention, the load directly applied to the bolster is transmitted through springs to a lower transverse beam that is suspended from the bogie frame and this frame is supported through springs by longitudinal beams that are connected to vertically movable carriers between which and the axle boxes on the wheel axles, other springs are inter-

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posed, the arrangement being such that the load is transmitted through three sets of vertical acting springs.

Bogie trucks according to this invention can be constructed in various forms and the springs used therein may be of any of the kinds heretofore commonly used, such as coil springs, laminated carriage springs, or india rubber springs, or partly of one kind and partly of another.

In the accompanying illustrative drawings, Fig. 1 shows partly in side elevation and partly in longitudinal section, and Fig. 2 in plan, one construction of bogie truck according to this invention. Fig. 1 also showing in side elevation a pivotal platform or support for carrying one end of the underframe and body of the vehicle with which the bogie truck is to be used. Fig. 3 shows the truck partly in end view and partly in cross section on the line A A of Fig. 1. Fig. 4 is a cross section of the bogie truck and pivotal platform or support, taken on the line B B of Fig. 1.

In the construction shown, the bogie frame comprises two longitudinal side members or sole bars *a* of angle section, each provided on its outer side with two horn plates *b* with axle box guides *c* and a spring holding bracket *d*, and connected together at the central portion of their length by two transverse members or transoms *e* and a top plate *f*. The ends of the two sole bars are firmly connected together by bent end pieces *f*<sup>1</sup>. The transoms *e* comprise vertical plates of angle section, connected to the sole bars *a* by angle irons *g* and spaced at a suitable distance apart to accommodate the bolster *h* which is placed between them and provided with laterally arranged vertical bearing pieces *k* arranged to work between similar vertical bearing pieces *m* fixed on the transoms *e*.

The top plate *f*, which is curved at its opposite ends and extended at its sides in a longitudinal direction, so as to impart increased strength to the bogie frame, is formed with a central opening *n* and with two lateral openings *o* through which respectively extend the bogie centre *p* and lateral bearing pieces *q* that are carried by the bolster *h* and upon which a centre piece *r* and lateral bearing pieces *s* on a platform or support *t* to be connected to the underframe or body of the vehicle to be carried, respectively bear and move in the ordinary way. *h*<sup>1</sup> is the pivot pin for connecting the centre pieces *p* and *r* together in the ordinary way.

The bolster *h* is of box like section built up of transverse pieces of channel iron and top and bottom plates and is supported at its ends upon two pairs of coiled springs *u* carried by a transverse beam *v* which may, as shown, be of channel section and is supported at its ends by longitudinal bars *w* carried by the lower slotted ends *1*<sup>a</sup> of two pairs of links *1* the upper ends *1*<sup>b</sup> of which are jointed at *2* to the transoms *e*. The upper and lower ends of the springs *u* are arranged to respectively bear directly against bearing plates *3* and *4* that are fixed to the lower sides of the bolster *h* and transverse beam *v*, respectively, and are provided with vertical extensions *5* that enter the said coiled springs and hold them in position laterally. The longitudinal bars *w* that carry the ends of the transverse beam *v*, preferably engage in vee-shape bearings *6* formed on the underside of the lower bearing plates *4* and so arranged that the lower ends of the two pairs of links *1* are spaced farther apart than their upper ends, as heretofore usual.

Extending below each pair of axle boxes *7* at opposite sides of the bogie truck, is a longitudinal beam *8* provided with a pair of spring holders *9* between which and the spring holding bracket *d* are placed a pair of coiled bearing springs *10*. The ends of each longitudinal beam *8* pass through the lower slotted ends of a pair of inverted stirrup shaped carriers *11* each of which extends upwards between the opposite sides of an axle box *7* and the adjacent axle box guides *c*, each end of each beam being recessed at its lower side,

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as indicated at 12 in Fig. 1, and supported upon a vee-shaped lug or bearing 13 on a yoke piece 14 carried by the slotted lower ends of the corresponding carrier 11. Between the upper end of each carrier 11 and the top of the corresponding axle box 7 is placed a coiled spring 15 held in place laterally by a socket piece 16 on the carrier and a socket 17 on the top of the axle box. The lower ends of the horn plates *b* at each side of the bogie frame are connected together by a longitudinal rod or bar 18.

By supporting the longitudinal beams 8 by vertically movable carriers in the manner described, these beams can, as shown, be made in straight lengths without projections or joggled portions and therefore can be easily and cheaply constructed and can be readily placed and held in position for use.

Bogie trucks constructed as hereinbefore described are specially suitable for use as motor bogies for electrically propelled vehicles. For this purpose the casing 19 carrying the field magnets of each electric motor may, as indicated in Figs. 1, 2 and 3, be each journalled at one end upon one of the wheel axles and be supported at the other end by means of lugs 21 that are carried by the casing 19 and bear upon springs 22 carried by bearing plates 23 held by bolts 24 suspended from the top plate *f* of the bogie truck, the motor armature being geared to the axle in the usual way. The springs 22 may, as shown, conveniently be of the kind known as Spencer's No. 242 rubber concentric cylinders, but other kinds may be used if desired.

As will be obvious, the details of construction of bogie trucks according to this invention can be variously modified.

Bogie trucks constructed as described may be provided with any suitable arrangement of brake apparatus.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed I declare that what I claim is:—

1. A bogie truck wherein the bogie frame is supported by springs upon longitudinal beams that extend below the axle boxes of the truck and are supported at their ends by vertically movable carriers between which and the axle box supporting springs for the said beams are interposed, substantially as described.
2. A bogie truck according to the preceding claim, wherein the ends of the longitudinal beams are directly supported on bearings carried by the lower ends of the vertically movable carriers, substantially as described.
3. A bogie truck comprising a bogie frame, carrying wheels and axle boxes therefor, a vertically movable bolster carried by springs and a transverse beam suspended from the bogie frame, longitudinal beams arranged to extend below and suspended from the axle boxes through springs and vertically movable carriers and supporting springs arranged between the bogie frame and the longitudinal beams, substantially as described.
4. A bogie truck in which the bogie frame comprises two longitudinal members or sole bars that are connected together by transverse members between which a spring supported bolster is arranged to move vertically, and by a top plate formed with central and lateral openings through which the bogie centre and lateral bearing pieces on the bolster extend, the said sole bars being provided at their outer sides with brackets that rest on springs carried by two longitudinal beams each of which is arranged to extend below the pair of axle boxes at the corresponding side of the truck, each end of each longitudinal beam being supported upon a yoke piece carried by the lower slotted ends of a vertically movable carrier that extends over the adjacent axle box and between the upper end of which and the said axle box a supporting spring is interposed, substantially as described.

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5. The improved bogie truck constructed arranged and operating as hereinbefore described with reference to and shown in Figs. 1 to 4 inclusive of the accompanying drawings.

Dated this 28th day of November 1903

For the Applicant

W. LLOYD WISE

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Chartered Patent Agent.

Fig. 1.

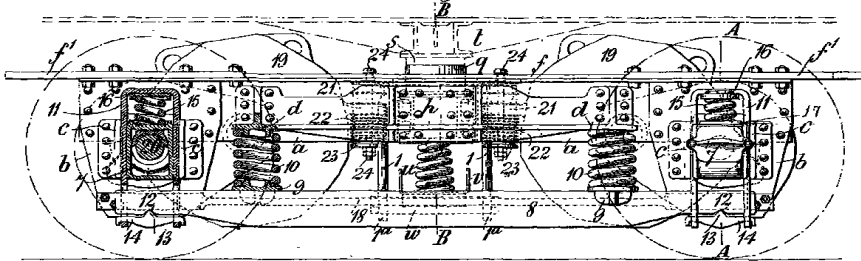
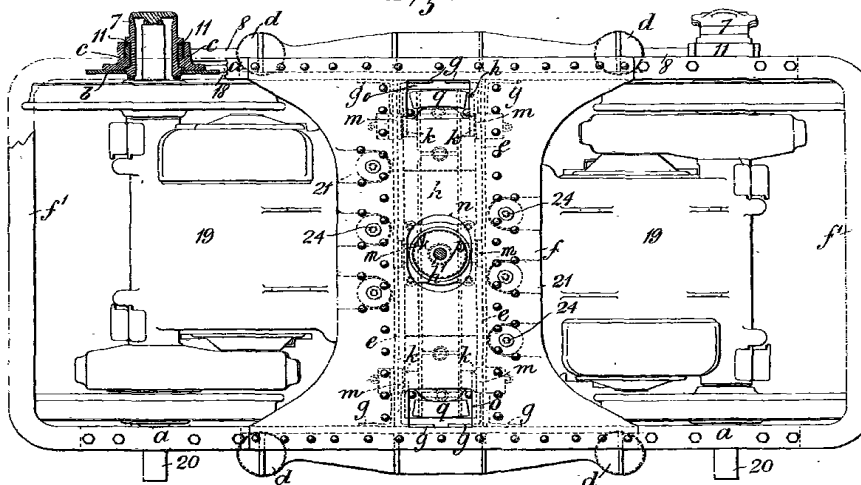


Fig. 2.



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Fig.  
B

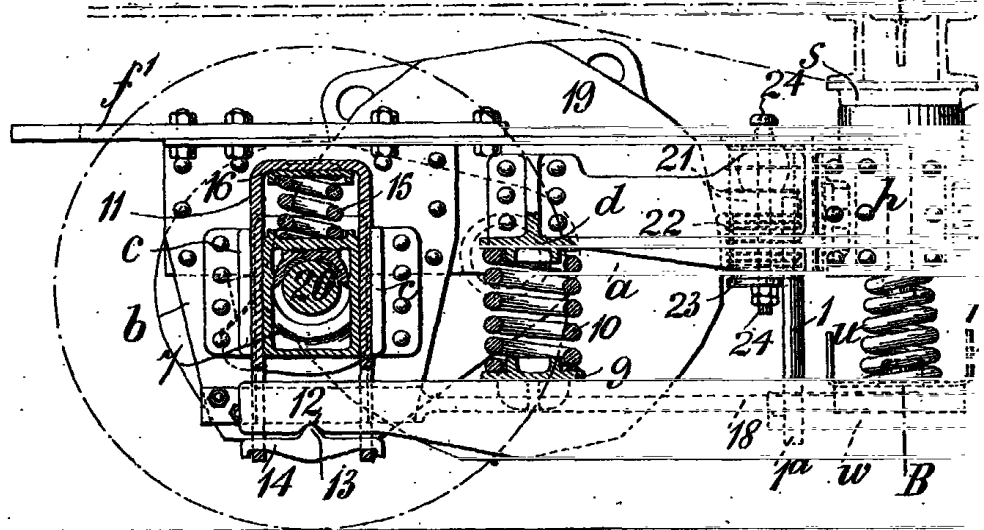
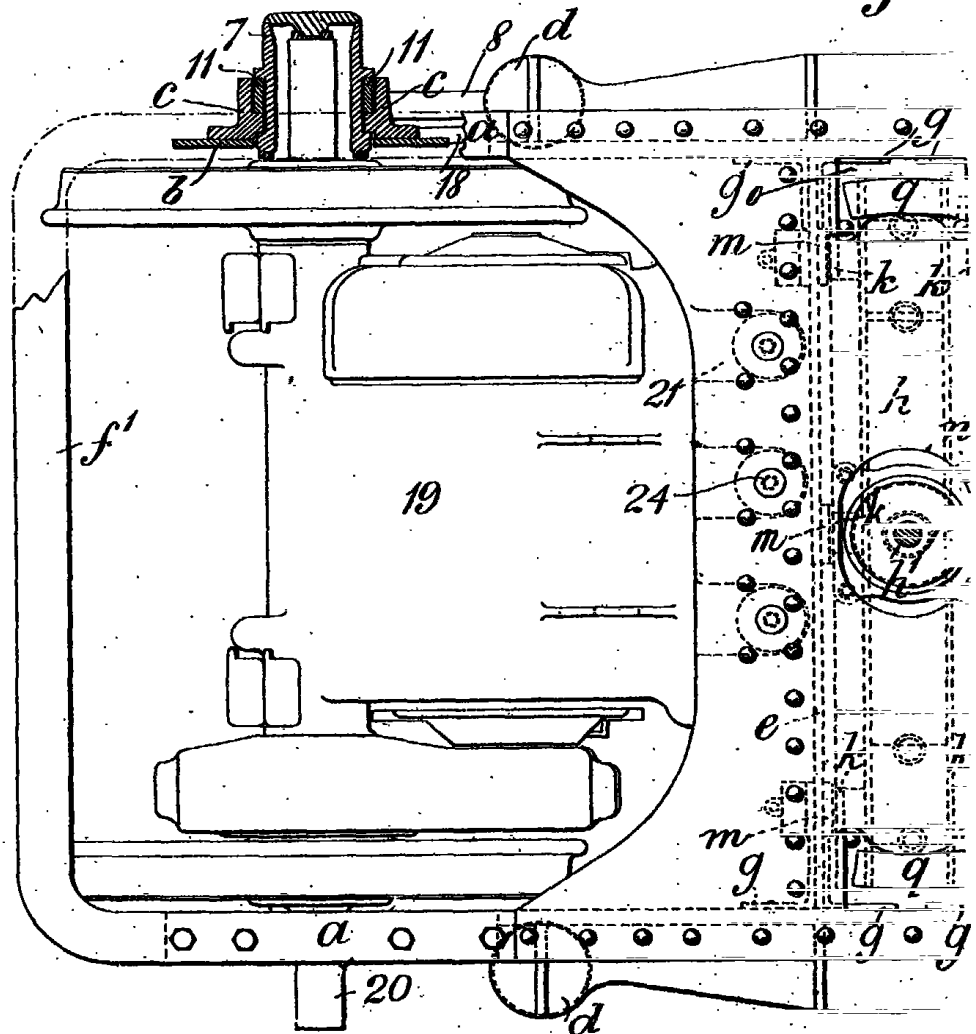
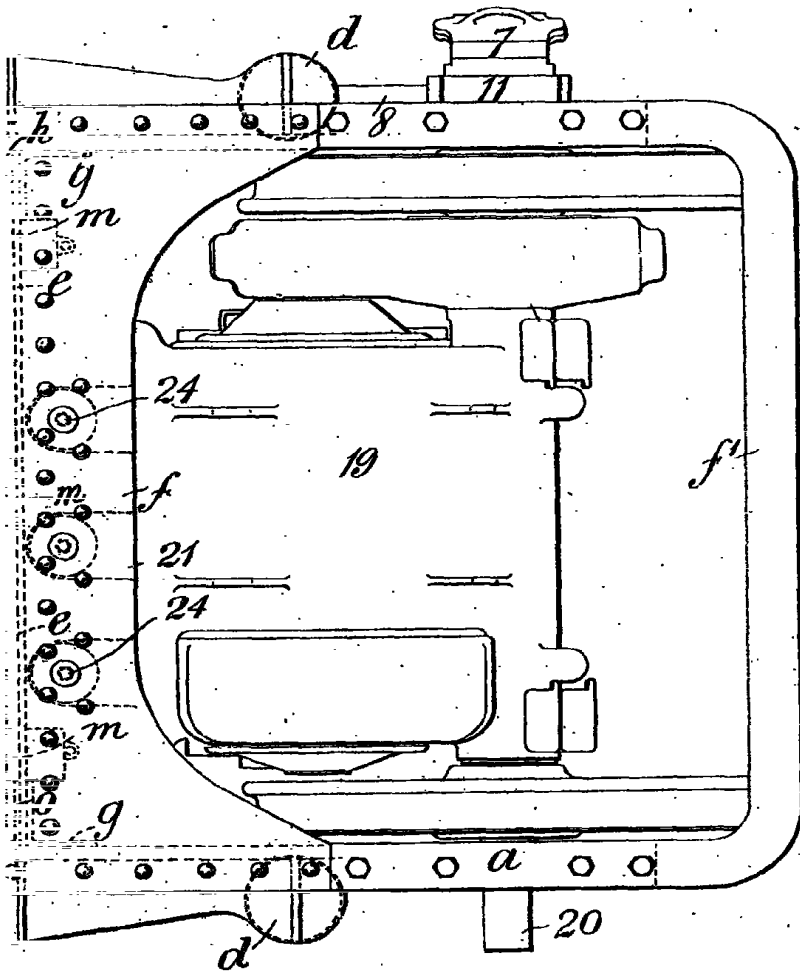
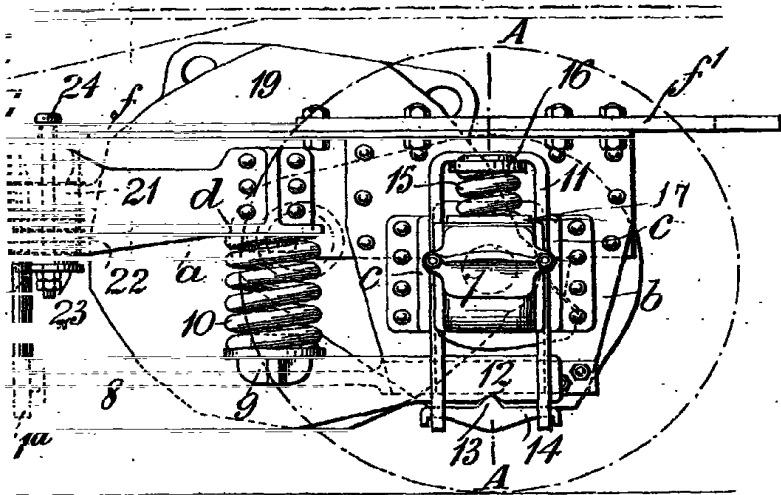


Fig. 2

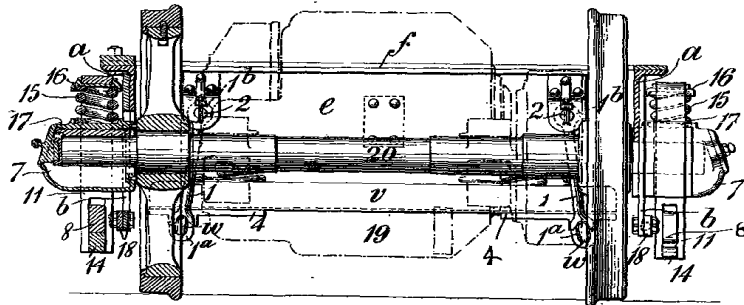




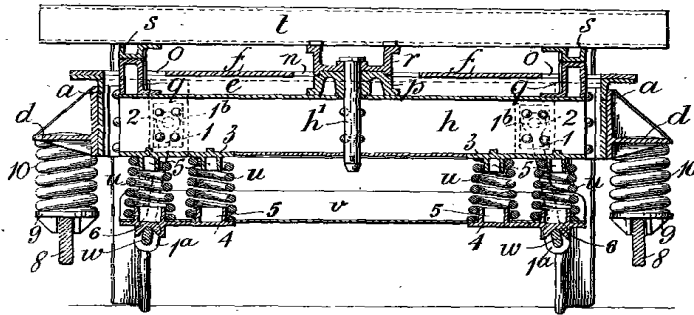
[This Drawing is a reproduction of the Original on a reduced scale.]



*Fig. 3.*



*Fig. 4.*



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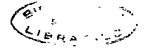




Fig. 3.

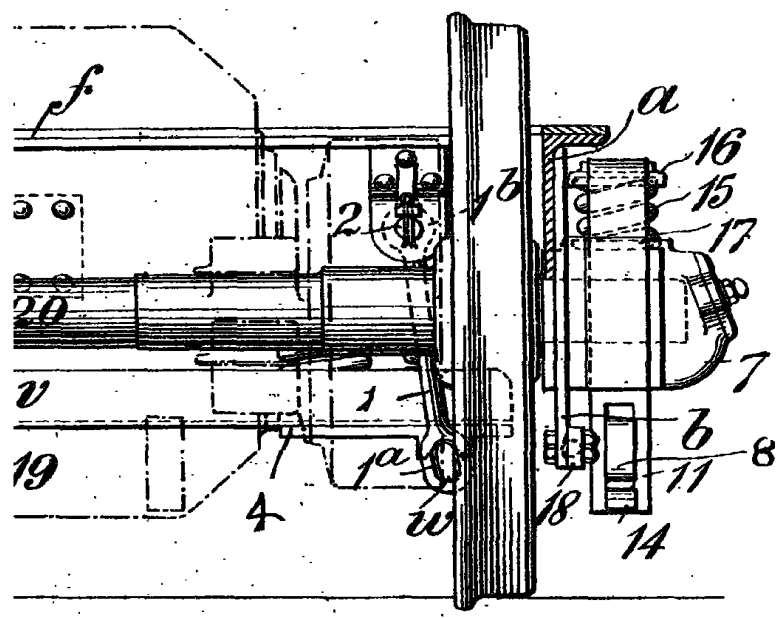
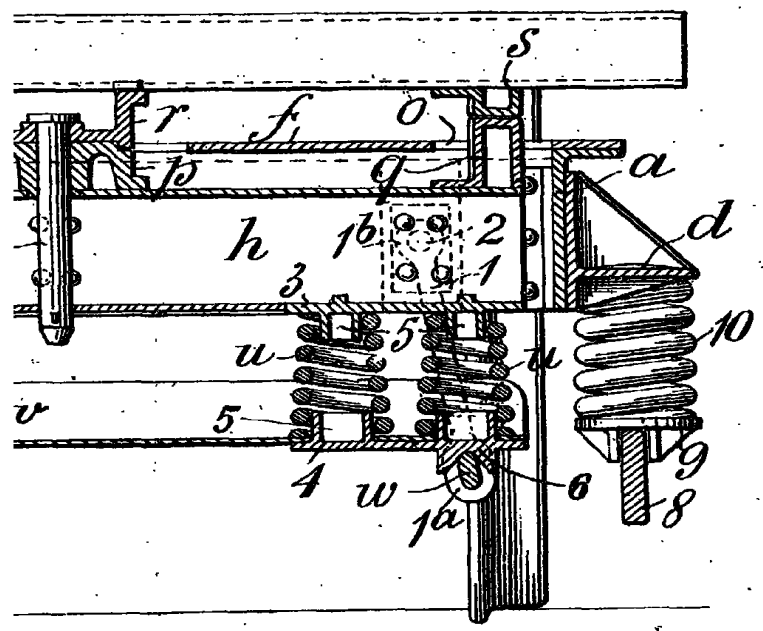


Fig. 4.



[This Drawing is a full-size reproduction of the Original.]

