S. M. VAUCLAIN.

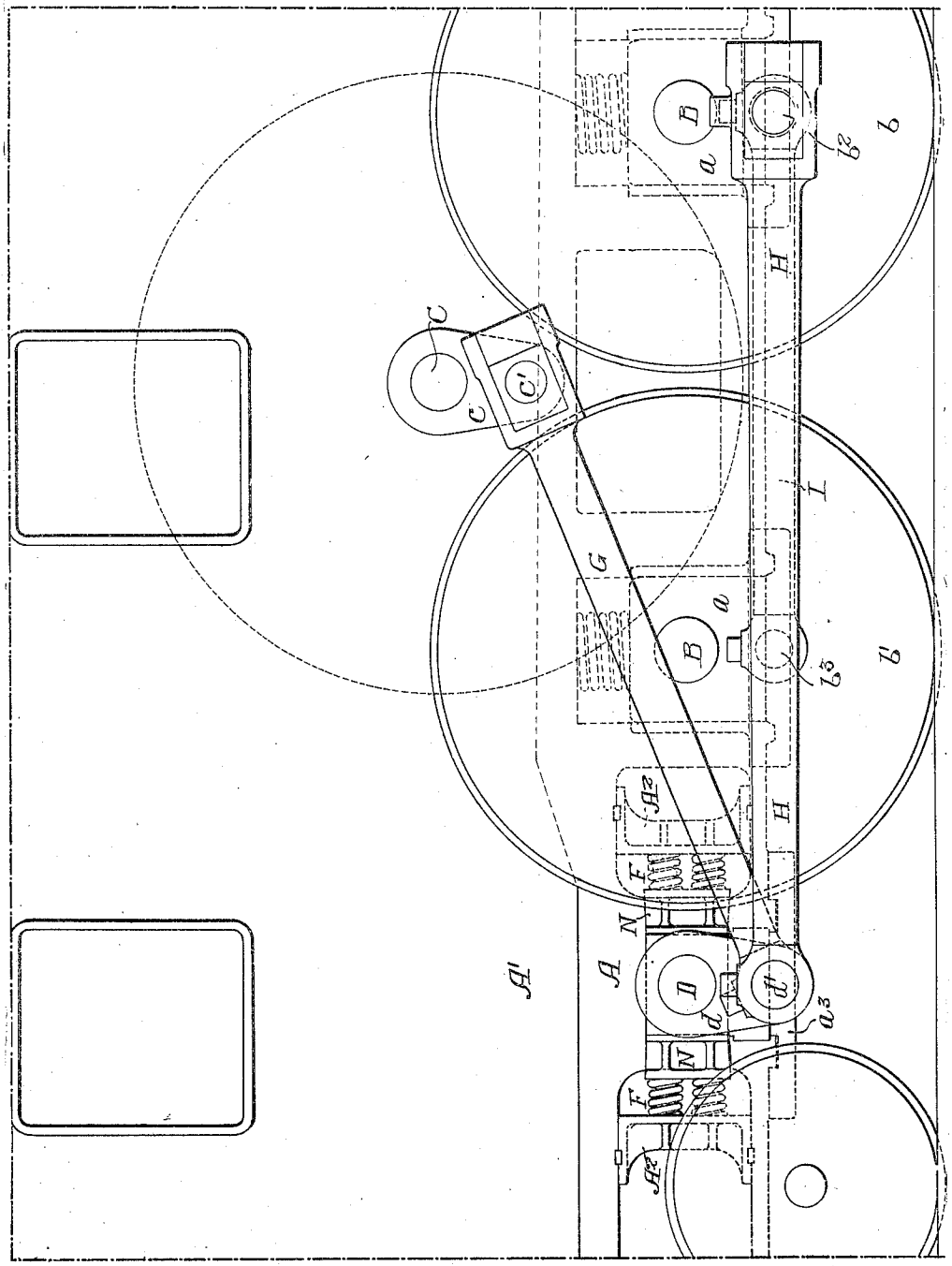
FLEXIBLE DRIVING CONNECTION.

APPLICATION FILED MAR. 24, 1909.

957,279.

Patented May 10, 1910.

2 SHEETS—SHEET 1.



Witnesses—
Wills A. Burrows
Walter J. Bullinger.

Fig. 1.

Inventor—
Samuel M. Vauclain,
by his Attorneys—
Howson & Howson

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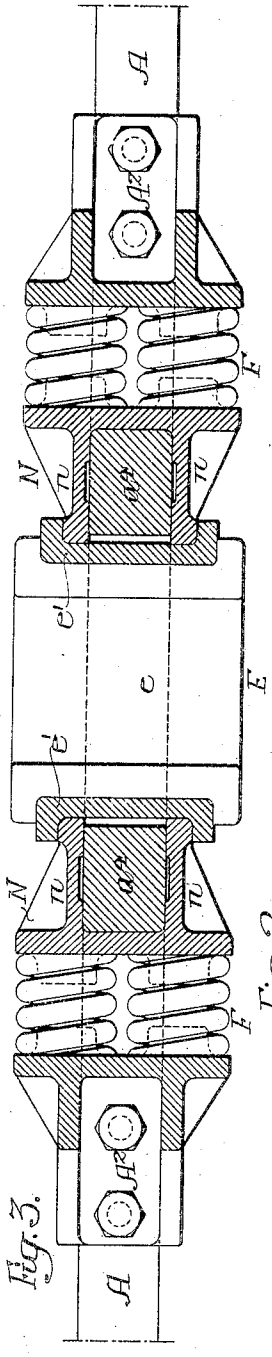

Fig. 3.

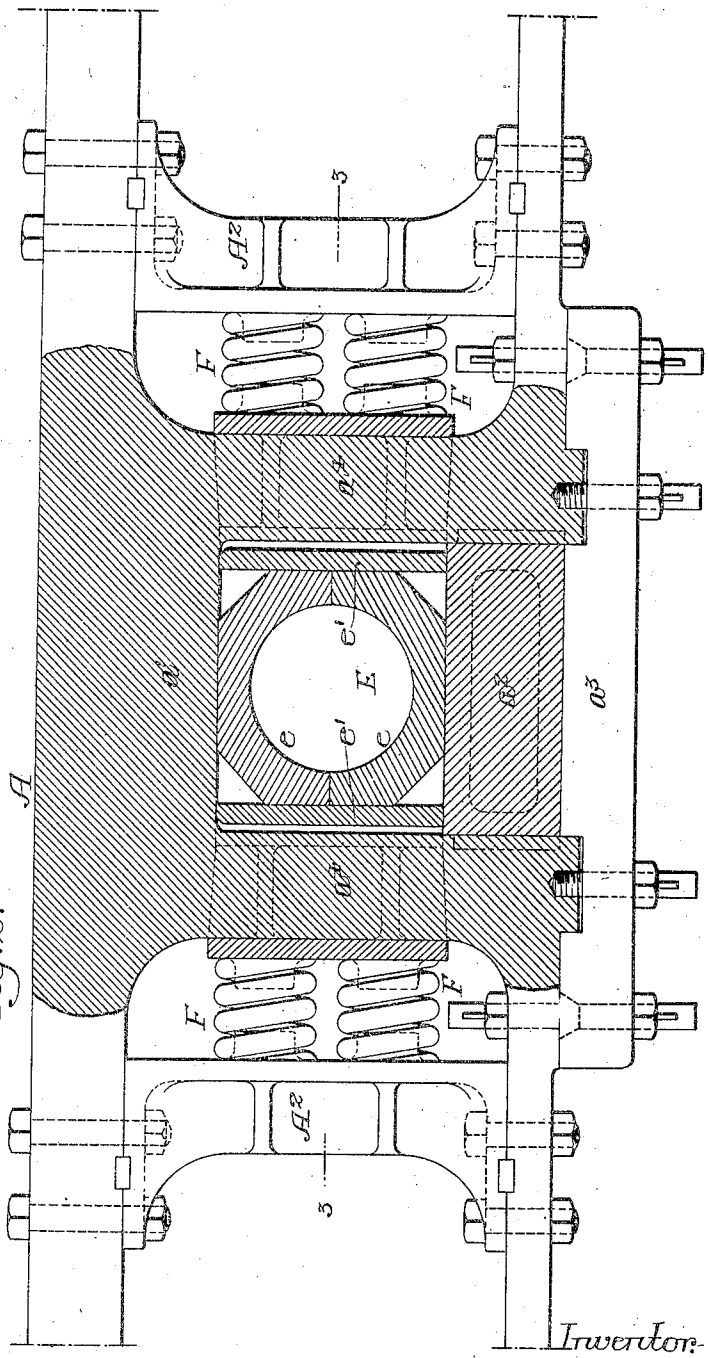

Fig. 2.

Witnesses.—
Wills A. Burrowes
Walter A. Bellinger.

Inventor:
Samuel M. Vauclain
by his Attorneys.
Howson & Howson

UNITED STATES PATENT OFFICE.

SAMUEL M. VAUCLAIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BALDWIN LOCOMOTIVE WORKS, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

FLEXIBLE DRIVING CONNECTION.

957,279. Specification of Letters Patent. Patented May 10, 1910.

Application filed March 24, 1909. Serial No. 485,456.

To all whom it may concern:

Be it known that I, SAMUEL M. VAUCLAIN, a citizen of the United States, residing at Philadelphia, Pennsylvania, have invented certain Improvements in Flexible Driving Connections, of which the following is a specification.

My invention relates particularly to the driving mechanism of an electric locomotive in which the motor carrying frame is spring supported, while the axles always have a fixed relation to the rails.

The object of my invention is to provide a flexible bearing between the driving element carried by the spring supported frame and the driven element which has a fixed relation to the rails, so that any slight difference in the relation of the parts will be taken by the flexible bearing and in the event of inaccuracy in adjustment the flexible bearing will yield, thus avoiding fracture of any of the parts.

While my invention is particularly adapted for use on electrically driven locomotives it will be understood that it can be used in other mechanisms where the relation of the driving to the driven element varies.

In the accompanying drawings: Figure 1, is a side view of sufficient of a locomotive to illustrate my invention; Fig. 2, is an enlarged longitudinal sectional view of the bearing; and Fig. 3, is a sectional plan view of the bearing on the line 3—3, Fig. 2.

A is the frame of the locomotive having a cab or body portion A′ of any suitable form.

B, B are the axles mounted in the usual boxes *a* between which and the frame are the usual springs so that the frame is spring supported upon the axles. On the axles B are the traction wheels *b*—*b*′.

C is the driving shaft coupled to an electric motor mounted on the frame A within the cab A′ in the usual manner. The bearings for this driving shaft C are rigidly connected to the frame. Consequently any movement of the spring supported frame will alter the relation between the driving shaft C and the axles B.

D is a shaft adapted to a bearing E mounted in the frame A and this bearing is confined against vertical movement in the present instance, but can move longitudinally to a limited extent having springs F bearing against its ends as clearly illustrated in Fig. 2. On the shaft D is a crank *d* having a pin *d*′ and on the driving shaft C is a crank *c* having a pin *c*′. Connecting the two pins *c*′ and *d*′ is a rod G of the usual type. On each of the wheels *b*—*b*′ are crank pins b^2—b^3 respectively in the present instance, although in some instances the crank pins b^2—b^3 may be mounted on cranks secured to the axles B—B independently of the wheels, the construction depending upon the type of locomotive used.

H is a connecting rod extending from the pin *d*′ on the crank *d* to the crank pin b^2 on the wheel *b*, and extending from this crank pin to the crank pin b^3 on the wheel *b*′ is a connecting rod I. On the rotation of the driving shaft, motion will be imparted to the wheels *b*—*b*′ through the medium of the crank shaft D and the connecting rods G, H and I. Thus it will be seen that the yielding bearing E will accommodate itself to any movement of the frame A and the driving shaft C independently of the axles B, and even if the parts are inaccurately adjusted, this yielding bearing will compensate for any inaccuracy of the parts. I preferably construct the bearing as shown clearly in Figs. 2 and 3. The bearing E has two half boxes *e*—*e* adapted to fit between the body portion *a*′ of the frame A and the block a^2, held in place by the lower clamp plate a^3. The half boxes are recessed at each side to receive the flanged plates *e*′ which fit between the half boxes and the pedestal a^4 of the frame, but there is a space left between these plates and the pedestal so as to allow for the slight movement necessary to compensate for the movement of the spring supported frame upon the axles.

N, N are spring plates having portions *n*—*n* extending on each side of the pedestals a^4 and bearing against the plates *e*′ and mounted between the spring plates N and the part A^2 of the frame are coiled springs F; projections on the spring plate and on the part A^2 holding the springs in position. By this construction if the crank shaft D is forced in one direction or the other, due to the movement of the frame in respect to the axles, then the springs on either one side or the other of the boxes will be compressed allowing the boxes to move and consequently overcoming the inaccuracy and preventing the breaking of any of the parts. In the

present instance the springs are so situated that they will allow a certain amount of longitudinal movement of the bearing with its shaft D, but the relation of the springs to the bearing will depend materially upon the position of the driving shaft in respect to the driving axles or shafts.

I claim as my invention:

1. The combination of an axle, a frame yieldingly mounted on the axle, a driving element rigidly secured to the frame, and a driven element on the axle, with a bearing mounted in the frame, a shaft in the bearing, and means for connecting said shaft with the driving and the driven elements, said bearing being yieldingly mounted so that it will compensate for the difference in the position of the driven and driving elements.

2. The combination of an axle, a frame yieldingly mounted on the axle, a driving shaft carried by the frame, a crank on the driving shaft, a crank connected to the axle, a crank shaft, a yielding bearing in which the crank shaft is mounted, and rods connecting the crank of the crank shaft, with said other cranks.

3. The combination with an axle, of a bearing mounted on the axle, a frame, springs between the bearing and the frame, a driving shaft mounted in bearings on the frame, a crank on the axle, a crank on the driving shaft, a crank shaft, a bearing therefor, springs allowing the bearing to yield under pressure, and rods connecting the crank of the crank shaft to said other cranks.

4. The combination of two axles, wheels thereon, bearings for the axles, a spring supported frame carried by the bearings, crank pins on the wheels, a rod connecting the two crank pins, a driving shaft mounted on the frame, a bearing on the frame, springs mounted on each side of the bearing to allow it to yield longitudinally, a crank shaft mounted in the bearing, a crank on the driving shaft, and a rod connecting the crank of the driving shaft with the crank shaft, said crank shaft being connected in turn to the crank upon one of the wheels of the axles.

5. The combination in an electric locomotive, of two axles, wheels having crank pins thereon, a rod connecting the two crank pins, boxes on the axles, a frame spring supported on the boxes, an electric motor carried by the frame, a driving shaft geared to the motor and rigidly mounted on the frame, a bearing mounted in the frame and having springs resting against each end thereof, said bearing being free to move longitudinally under pressure, with a crank shaft mounted in the bearing, a rod connecting the crank shaft with the driving shaft, and a rod connecting the crank shaft with the crank pin on one of the wheels of the locomotive.

6. The combination in a yielding bearing, of a frame having pedestals, a bearing box mounted between the pedestals and held in place vertically, plates mounted between the pedestals and the bearing, spring plates having members extending on each side of the pedestals and resting against the first mentioned plates, with springs back of said spring plates so as to allow the bearing to yield when subjected to undue pressure.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

SAMUEL M. VAUCLAIN.

Witnesses:

JACQUES L. VAUCLAIN,

WM. RHODES.