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(54) CATERPILLAR

(54) CHENILLE DE TRACTION

(57) Abstract:

The object of my invention is to provide a supple cater-pillar for motor vehicles characterized by the fact that it comprises an endless belt having on its inner face a known guiding and driving device on each side of which run the vehicle-carrying rollers, while the outer face of said belt is so designed as to receive one or several removable tyres, either pneumatic or made of someplastic material , forming a continuous ground tread. Rigid cross slabs are interposed between the continuous roller treads and the continuous ground tread, said slabs , arranged very close the one another , ensure an even tread for the rollers at a certain height above hard going and limit the sinking into soft going. Said slabs are so profiled as to permit the roller treads to be mounted on one of their faces, while the ground tread is mounted on their other face , said profile being preferably designed in such a way that the developed mean practical length of both treads be the same.

In order to make my invention more clearly understood , I have illustrated as examples various embodiments thereof in and by drawings appended hereto and wherein:

Figure 1 is a section according to line A-B of Figure 2, the latter showing a portion of a caterpillar the ground tread of which is supposed to be a pneumatic tyre .

Figure 3 is a plane view of Figures 1 and 2 .

Figure 4 is a sectional view of a modification.

Figure 5 shows, also in section, the mounting of a ground tread constituted by a solid tyre made of plastic material .

Figure 6 is an elevation of the said section and Figure 7 is a plane view of the same .

Figure 8 is a sectional view of another modification.

Figure 9 is a part elevation of the caterpillar shown by Figure 8 .

Figure IO represents in plan the same arrangement as Figures 8 and 9.

Figure 11 shows in elevation and diagrammatically a whole caterpillar system.

Figure I2 shows a modification comprising a solid tyre .

Figure I3 shows in section another modification with twin pneumatic tyres .

I will first describe the device illustrated by Figures 1, 2 and 3 .

On the supple endless belt 1 (figures 1 and 2) serving as a tread for the rollers 2, are secured at regular intervals and almost contacting with one another metal slabs 2' (Figures 1,2,and 3) fitting the whole width of the belt and the form of which is adapted to receive on the outer face a removable special tyre 3, forming a ground tread and supposed to be a pneumatic tyre on Figure 1.

On each side of the special tyre 3 cables 4 are mounted , stretched and hooked on slabs 2', so as to avoid that, during travel, the cables might get longitudinally shifted respective said slabs. The inner face of the metal slabs 2' is made to bear on the supple enless belt 1 by means of bolts 5, which secure at the same time on the belt the guiding and driving beads 6, of known type .

Obviously, the cables 4 might be replaced by super-

imposed canvasses, or by sennits or braids made of metal or of any other material.

Cables 4, which are more rigid than the supple belt 1, will determine the developed length of the set. The bead 7 that secures tyre 3 being arranged on the same plane as cables 4 will have the same developed length as the latter and , consequently , will travel paripassu . There will, therefore, be no tendency to any relative motion between the ground tread tyre and the rest of the set .

On the other hand, it will be apparent that ,owing to the rigid cross slabs 2' secured very close to one another on the roller tread 2 on the face opposite the latter's tread, the rollers will , on hard ground ,run suspended at a certain height above the ground corresponding to the height of the ground tread. On soft going , the middle tread sinks and the whole width of the belt then comes to bear . Then the metal slabs 2' serve to protect the roller tread belt .

The above combination enables me to provide extremely broard supple caterpillars for travel over soft going while having for travel over hard going, such as roadways , for instance , a narrow and continuous resilient tread .

I would also point out that the rollers need not be of the same width as their supple tread. They may be narrower, the rigid cross slabs 2' being obviously able to bear a marked overhang.

Furthermore , it will be realised that the metal slabs, being secured closely adjacent to one another , ensure perfect continuousness of the roller tread. It will be also realised that where not this

condition fulfilled no useful speed could be obtained. As a matter of fact let us just suppose that the slabs be somewhat spaced , and it becomes apparent at once that the carrier rollers influenced by their load would curve in the supple belt 1 on which they run in the intervals offering between the slabs .The effect of this would be to cause in the travelling of the rollers jolts and jars , debarring speed and jeopardising the life of the set .

Figure 4 represents , in section , a caterpillar with independent treads , wherewith the roller tread is composed of two supple endless belts I' (figure 4) independent from oneanother . Said two belts I' are connected with oneanother by slabs 2', of suitable shape and very closely adjacent , like the slabs 2' of Figures 1,2 and 3. Slabs 2' (figures 4,5,6 and 7) are designed to receive on one face ,in their middle , the ground tread tyre 3 ,represented by a special pneumatic tyre on Figure 4 and by a solid tyre on Figures 5,6 and 7 ,and, on the other hand, on their opposite face and on each side of the ground tread ,the two independent supple belts 1' (Figures 4,5,6 and 7) serving as a continuous tread for the rollers 2.

Said tread belts 1' may be secured to the slabs 2' either by means of screws and nuts or of rivets I2 the heads of which are sunk in the belt (figure 4) or be hooked on or clamped in any suitable manner as, for instance , in the way examplified by figures 5,6 and 7 where the edges I3 of slabs 2' are beaten down on the tread belts .

The guiding and driving beads 6 (Figures 4,5 and 6) are secured by means of bolts 5 directly on slabs 2'.

Here, the mean developed length is given by the two roller tread belts and the tyre securing bead which are on the same level.

It should be noted that the ground tread securing beads are manufactured less supple than the rest of the tyre so that the developed length of the bead controls, as it were , the actual developed lengh of the rest of the tyre .

It will be readily realised that with the solid tyre of Figures 5,6 and 7, for instance, the bead of said tyre can be constituted by canvasses or by some comparatively hard gum , while the rest of the tyre would be made of more supple and, consequently resilient , india rubber .

Moreover , the part of the tyre contacting with the ground has notches I6 (Figures 6 and 7) calculated to improve both adhesiveness and suppleness . Such tyre will , therefore , lend itself without difficulty to any deformations which it is expected to undergo.

Similarly , with the type shown by Figure 4, persons skilled in the art are aware that the bead of tyres is well nigh inexpansible, while the cover itself, together with its inner tube lends itself to all sorts of deformations.

Here (Figures 4,5,6 and 7) ,as in the case of Figure 1, the rigid cross slabs permit the rollers to be susponded above the ground on hard going and limit the sinking on soft surfaces . also and as previously , the slabs 2' are arranged very closely adjacent to oneanother so as almost to contact ., in view of avoiding that the roller tread supple belts 1' might curve in between

the slabs, which, as has already been hereinabove explained would debar rapid travel and would soon spoil the belts 1' themselves and injure the mechanism.

In the cases shown by Figures 8,9 and IO are found again nearly the same general characteristics as with the foregoing devices.

The supple endless belt 1 carries on its inner face an already known guiding and driving device constituted by suitable blocks 6 on each side of which are the continuous roller treads 2, such treads being formed by the inner face itself of the belt .

The outer face of said belt is designed to receive a pneumatic tyre .

Said tyre 3 is kept in place on the supple belt 1 by means of narrow and rigid cross barlets 2' secured at approximately equal intervals by rivets I2 or by bolts. As will be readily realised , suppleness of the belt is ensured owing ,on the one hand to the narrowness of barlets 2' and, on the other hand, to the intervals provided between them.

Figure I2 shows the mounting of a solid tyre 3 grafted on a dummy belt I7 that serves as a backing for it , and the sides of which ,protruding beyond tyre 3, serve as a securing means on the supple belt by means of the barlets 2' , like the one provided on Figure 8 for securing the pneumatic tyre .

As in the precedent cases, the form of the flat part protruding on either side beyond tyre 3 may vary ad infinitum.

No drawing is required plainly to understand that the solid tyre 3 (Figure I2) can be replaced by a hollow tyre , intermediate between a pneumatic and a

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solid tyre , said hollow tyre being provided with beads adapted to secure it in the same manner on the supple belt .

On figure 13 are shown twin pneumatic tyres also secured by means of barlets 2'. While in the foregoing embodiments two barlets were sufficient to hold the tyre, three are required here, one on each side and one in the middle which serves to hold the inner beads of both tyres .

To remove the ground tread , when said tread is constituted by a pneumatic tyre, it has but to be deflated and to be withdrawn laterally , which is possible owing to the suppleness of the roller tread.

I can also replace the twin pneumatic tyres by twin hollow or solid tyres .

I can again, for much heavier machines , put three or more tyres side by side and always mounted on the supple caterpillar without departing from the scope of my invention.

It will be noted that , like with the devices shown by Figures 1 to 7 , the barlets serve not only to keep in place the removable tread but also as a shield or armour protecting the belt itself, for instance on very pebbly going where pebbles or flints are encountered the size of which reaches higher than the height of the tread --belt .

Having now particularly ascertained and described the nature of my said invention as well as the manner in which the same is to be performed , I declare that what I Claim is :

1.- A caterpillar for motor vehicles comprising an endless belt, driving means carried by the inner surface of the belt, and a tire secured upon the exterior surface of the belt.

2.- A caterpillar for motor vehicles comprising an endless belt, driving means attached to the inner surface of the belt, and a continuous tire arranged longitudinally on the belt substantially narrower in width than the width of the belt.

3.- A caterpillar for motor vehicles comprising an endless belt, driving means secured to the inner surface of the belt engagable with a suitable driving apparatus mounted on the vehicle, and a tire secured in continuous longitudinal arrangement on the exterior surface of the belt having a reduced width with respect to the width of the belt so that the side edges of the belt extend laterally beyond the tire tread.

4.- A caterpillar for motor vehicles comprising an endless belt, driving means carried by the inner surface of the belt engagable with a suitable driving apparatus mounted on the vehicle, a plurality of traction members secured in transverse adjacent positions upon the exterior surface of the belt, and a tire secured longitudinally upon the exterior surface of the belt having an exterior tread surface less than the width of the belt.

5.- A caterpillar for motor vehicles comprising an endless belt, driving and guiding means carried by the interior surface of the belt engagable with a suitable drive apparatus, a plurality of tread slabs secured transversely in adjacent positions on the exterior surface of the belt in continuous arrangement, a continuous tire attached in longitudinal position on the exterior surface of the belt and slabs, the said tire having its tread surface disposed outward of the belt and of reduced width with respect to the belt so that the side portions of the belt and slabs will overhang the tire.

6.- A caterpillar for motor vehicles comprising an endless belt, driving and guiding means carried by the inner surface of the belt engagable with suitable driving mechanism, a series of transversely directed slabs secured in separated adjacent positions on the exterior surface of the belt and extending from edge to edge thereon, a continuous tire secured in a central longitudinal position on the exterior surface of the belt, and a plurality of continuous strips secured upon the exterior surfaces of the slabs at each side of the tire.

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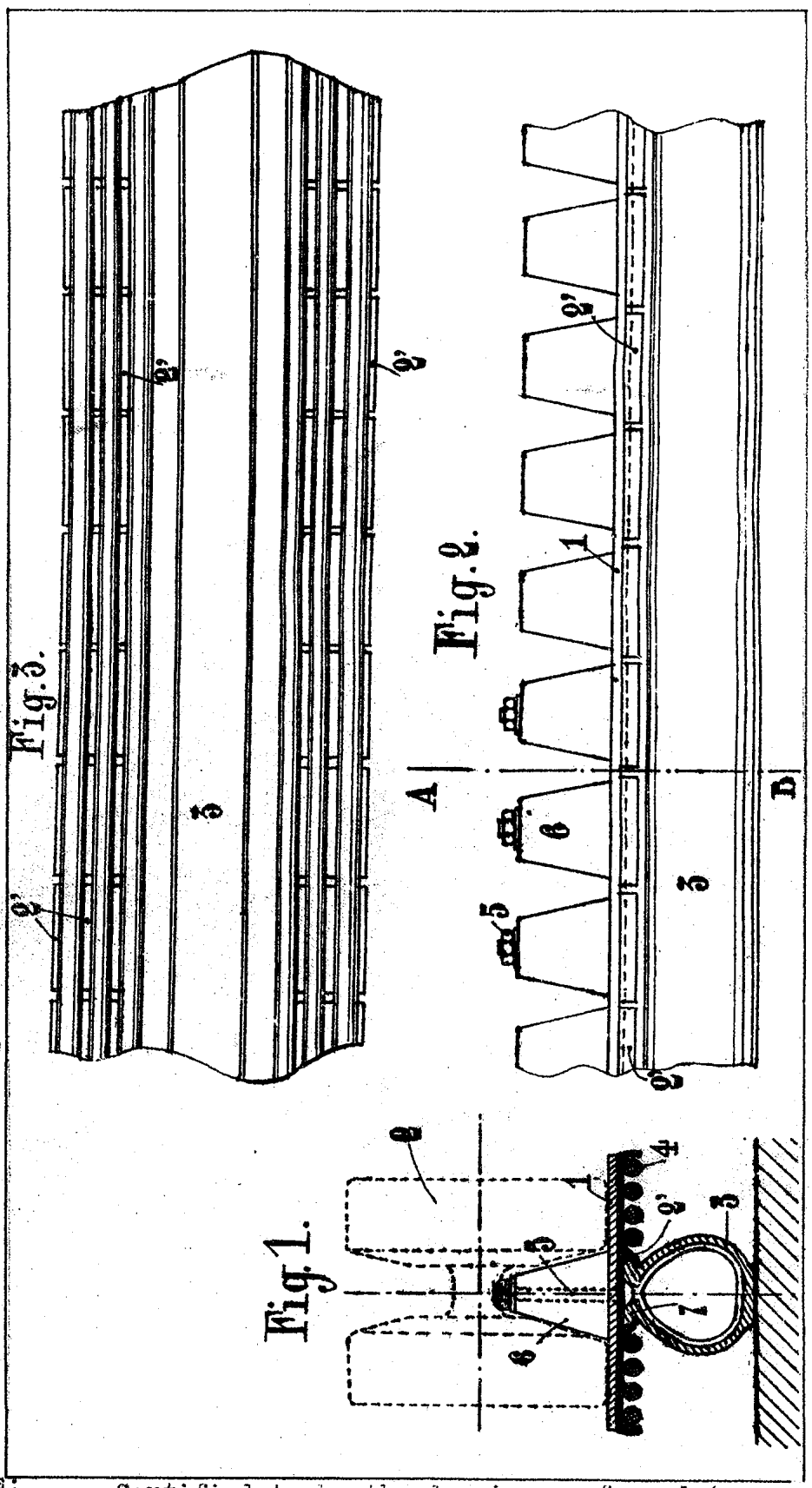

Witnesses:

Certified to be the drawings referred to in the specification hereunto annexed.-
MONTREAL, December 21st, 1926.-

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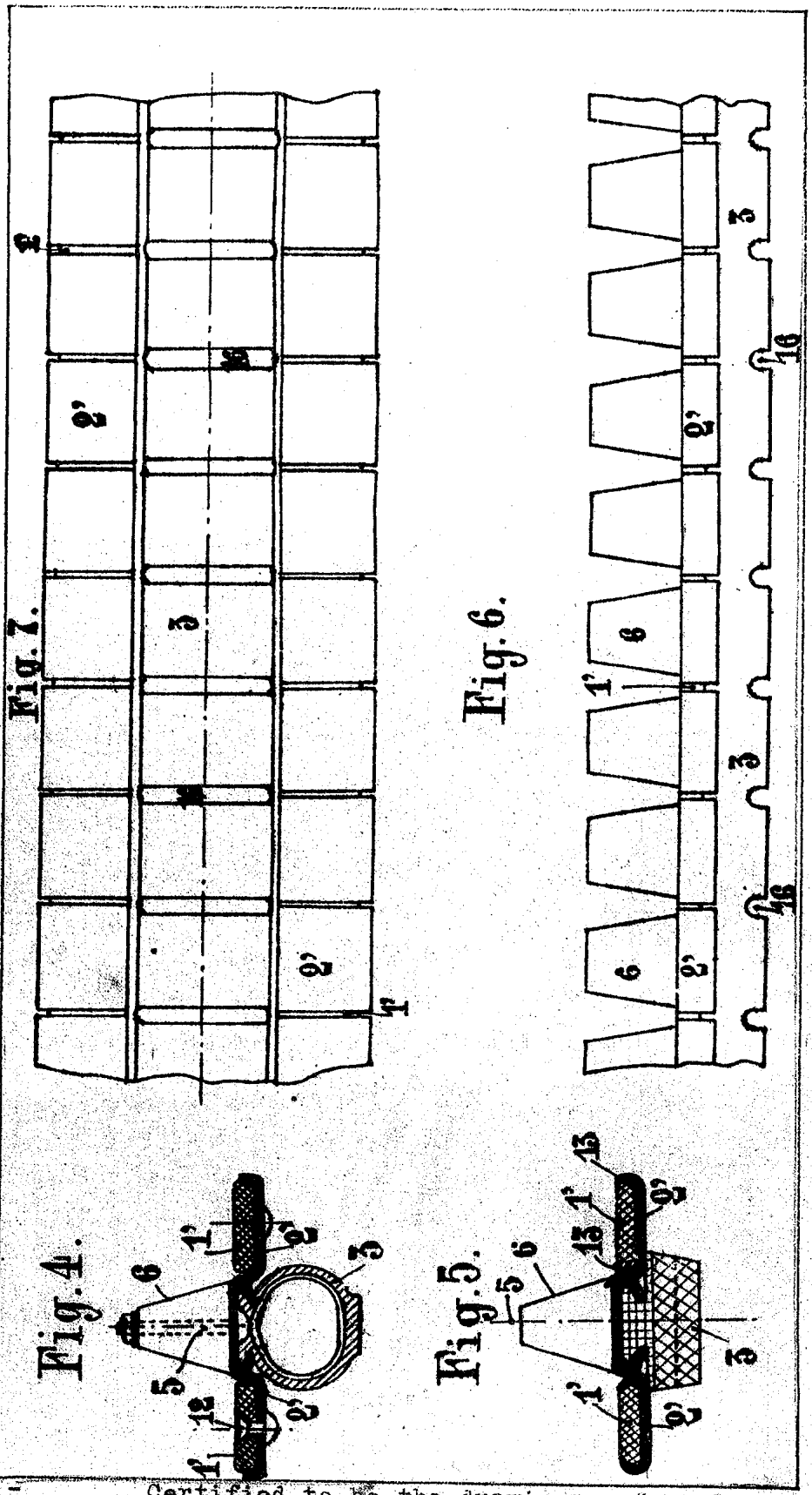

Witnesses:-

A. Robic

A. Deschamps

Certified to be the drawings referred to in the specification hereunto annexed.-MONTREAL, Dec.,31st,1926.

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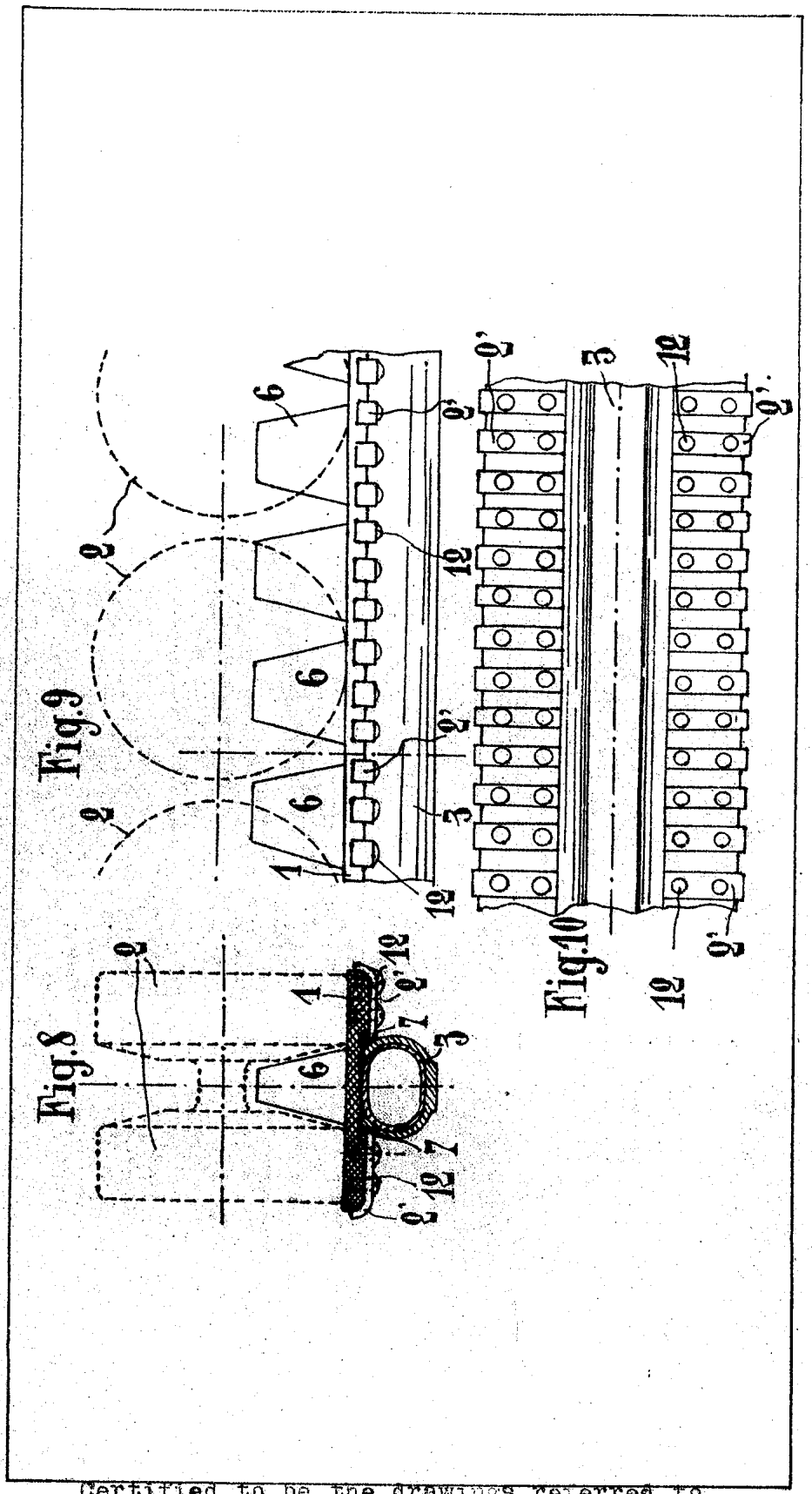

Witnesses:-

B. Robic

A Weschamps

Certified to be the drawings referred to in the specification hereunto annexed.-

MONTREAL, December 31st, 1926.-

INVENTOR:

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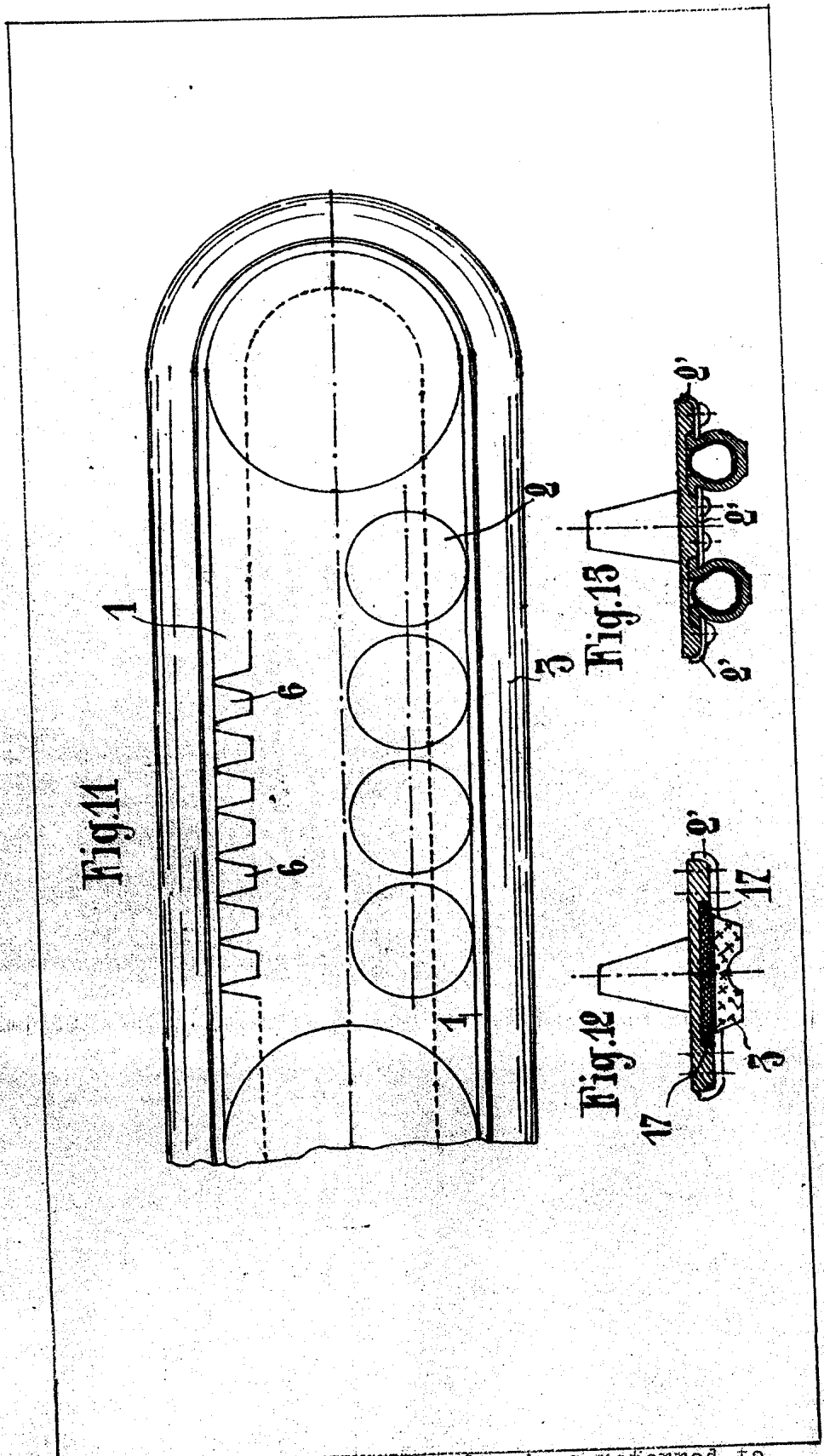

Witnesses:-

B. Robic

A Deschamps

Certified to be the drawings referred to in the specification hereunto annexed.-
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