N° 12,494 A.D. 1912

Date of Application, 25th May, 1912—Accepted, 12th Dec., 1912

COMPLETE SPECIFICATION.

Improvements in or relating to Change Speed Gears.

I, VINCENZO LANCIA, Engineer, of 99, Via Monginevro, Turin, Italy, 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 relates to means for controlling the change of speed in motor cars, more particularly applicable to those types in which the change speed gear, being mounted on the rear axle, is caused to oscillate with the latter about a transverse axis situated in the front portion of the car, at a greater or less distance from the engine.

In this case, the members transmitting to the change speed box the movements of the lever arranged within reach of the driver, must be connected to the driving shaft in such manner as to follow the oscillations of the latter, consequently an ordinary control of the said members could not be used without running the risk that, owing to the oscillations of the rear axle, the position of the speeds would change independently of the will of the driver.

It has already been proposed to this end to connect the controlling member, at a point close to the axis of oscillation of the rear axle, to an oscillating member operated at the other end by the driver.

According to the present invention any oscillating intermediate member is avoided owing to the fact that the member connected with the movable pinion is connected, by means of a collar and a fork, with a rod substantially parallel to the said member and extending into proximity to the axis of oscillation of the rear axle, this end of the rod being jointed to a connecting rod which at its other end is jointed to the arm actuated by the operating lever.

The invention also comprises the mounting of two auxiliary rods at the two sides of the driving shaft as well as the controlling device for actuating either of the arms by means of the operating lever.

A construction of the controlling means, applied to a change speed gear with two direct drives controlled by connecting members inside the driving shaft, is illustrated by way of example in the accompanying drawings in which Figure 1 shows diagrammatically in side elevation the arrangement of the levers.

Figure 2 shows in plan, on an enlarged scale, the front end of the driven shaft and of the connecting members.

Figure 3 is a cross-section of the cross-spindle and operating levers,

Figure 4 shows in plan the guide for the operating levers, and

Figures 5 and 6 are respectively longitudinal section and front elevation of the member used for throwing the operating lever into gear with the arm connected to one or the other of the connecting members.

Figures 7 and 8 are similar views of the clutch sleeve for the control of one connecting member, and

Figure 9 is a front elevation of a lever for the control of the other.

As will be seen in Figures 1 and 2, the tube or radius rod 1 secured to the change speed gear box 2 which is secured to the rear axle of the car is mounted

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so as to be able to oscillate about the axis X X, in order to allow of the oscillations of the rear axle to which it is secured. This tube 1 contains the driving shaft 3, within which are arranged the two concentric connecting members 4 and 5 adapted to operate the toothed wheels of the change speed gear.

The front end of the member or rod 4 is connected by means of a pin 6 passing through two longitudinal slots 7 provided in the shaft 3, to a collar 8 operated from the outside by means of a fork 9 passing through the slot 10 of the tube 1.

In the same way, the front end of the rod 5 is connected by a pin 11 passing through two longitudinal slots 12 of the shaft 3, to a collar 13 operated from the outside by means of a fork 14 passing through a slot 15 of the tube 1.

Each of the forks 9 or 14 is connected to a rod 16 or 16^1 (Figures 1 and 2) which, at its other end, is pivoted at 17^{11}, to a rod 17 or 17^1, and the latter is in its turn pivoted at its other end to the arm 18 or 18^1 mounted on the cross-spindle 19.

The rods 16 and 16^1 connected to the forks 9 or 14, are provided with an ordinary ball stop such as shown in Figure 2. Each of the arms 18 or 18^1 can be operated by the lever controlling the change speed gear, in the following manner:

On the cross-spindle 19 (Figure 3) pivoted in the bearings 20 of the longitudinal members 21 of the chassis and to which is secured the lever 22 used for manipulating the brake, is mounted a tubular sleeve 23 secured to the change speed lever 24 which, as in ordinary constructions, is guided in a gate 25 (Figure 4). This tubular sleeve 23 is provided at its other end with a part 26 provided inside with teeth 27 (Figures 5 and 6) by means of which it can engage the teeth 28 of a sleeve 29 secured by the tube 30 to the arm 18, or with the teeth 31 of the head 32 of the arm 18^1.

It will be now understood that, by shifting the lever 24 laterally, that is to say, along the axis of the spindle 19, which can be effected by means of the gate 25, the said lever can be coupled either to the arm 18 or to the arm 18^1 in order to operate the rod 5 or the rod 4.

By turning the lever 24 on its pivot, the two arms 18 or 18^1 are rotated, and consequently, by means of the connecting rods 16, 17, or 16^1, 17^1, the movement required to bring the corresponding pinion of the change speed gear into or out of engagement, is transmitted to the forks 9 or 14.

By examining Figure 1, it will be clearly seen that in that way the movements which the tube 1 and the driving shaft with the control tie rods mounted in its interior, may experience owing to the oscillation of the rear axle, cannot affect in any way the position of the forks 9 or 14, that is to say, they do not produce any change in the positions of the pinions, owing to the axis X X about which oscillates the rear axle, being near the point 17^{11} about which oscillate the rods 17 and 17^1 (see position shown in dotted lines in Figure 1).

The connecting members for the control of the change speed gear could be arranged outside, instead of inside, the driving shaft without departing from the spirit of the invention.

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

1. Controlling means for motor-car change speed gears mounted on the rear axle, having the arrangement that the fork, gearing with the controlling rod, is in one piece with an arm guided substantially parallelly to the rod itself and which at a point near the axis of oscillation of the rear axle is jointed to a connecting rod pivoted at its other end to the arm mounted on the shaft of the operating lever.

2. Controlling means as claimed in Claim 1, applied to the case in which the members for controlling the pinions are arranged in the interior of the driving

shaft, comprising two arms mounted on the transverse shaft and operated by the operating lever, the said two arms being mounted at the two sides of the driving shaft and each being connected by means of two jointed connecting rods to a fork surrounding a collar secured to the corresponding rod by a key which passes through slots in the shaft.

3. Controlling means as claimed in Claims 1 and 2, in which each of the arms connected to the corresponding rods is secured to a toothed sleeve with which can be made to gear alternately, by a lateral movement, a toothed part secured to the controlling lever operated by the driver.

4. The controlling means for change speed gears substantially as described or as illustrated in the accompanying drawings.

Dated this 25th day of May, 1912.

BOULT, WADE & TENNANT,
111/112, Hatton Garden, London, E.C.,
Chartered Patent Agents.

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A.D. 1912. May 25. No. 12,494.
LANCIA'S Complete Specification.

(2 SHEETS)
SHEET 1.

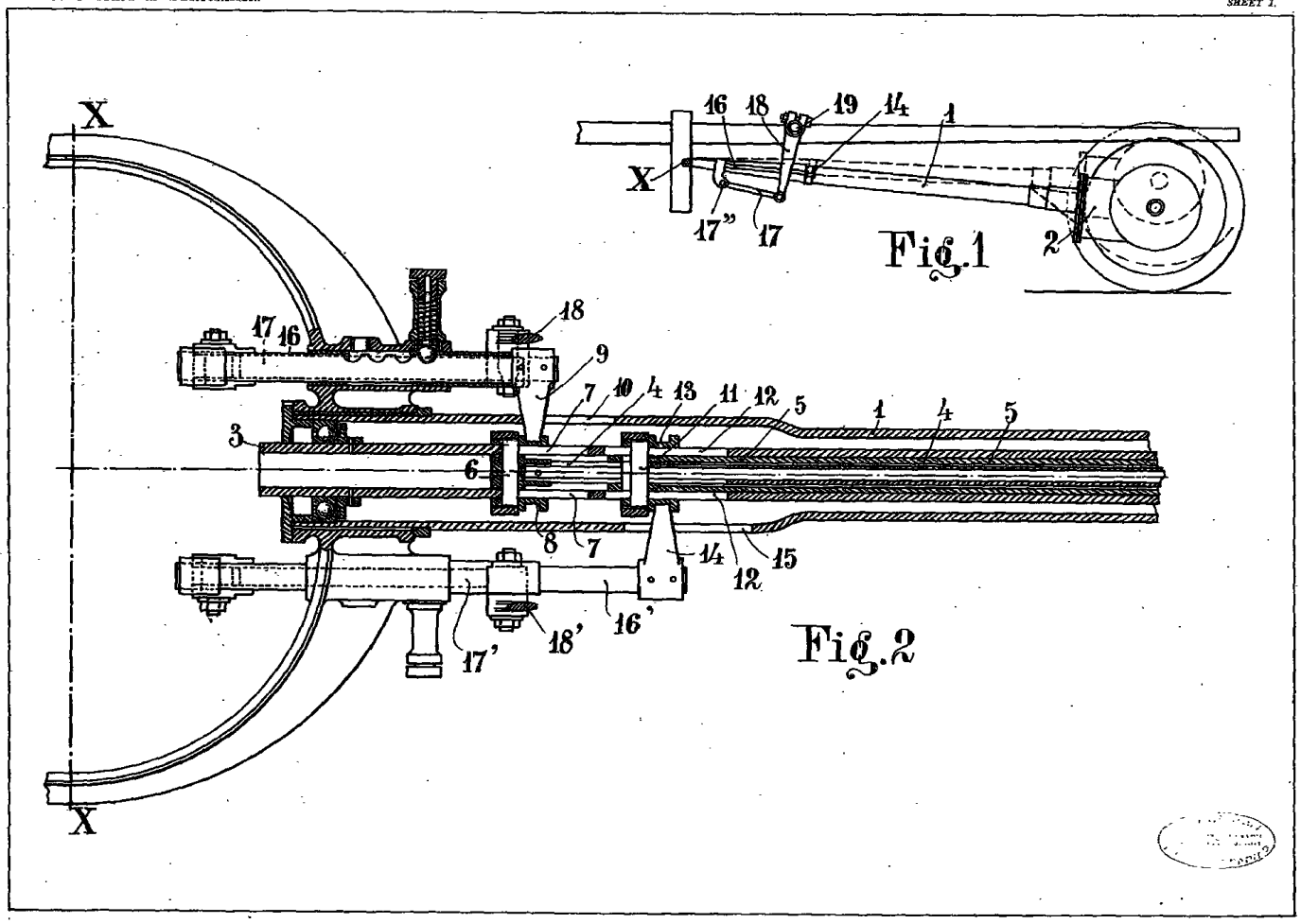

Fig. 1

Fig. 2

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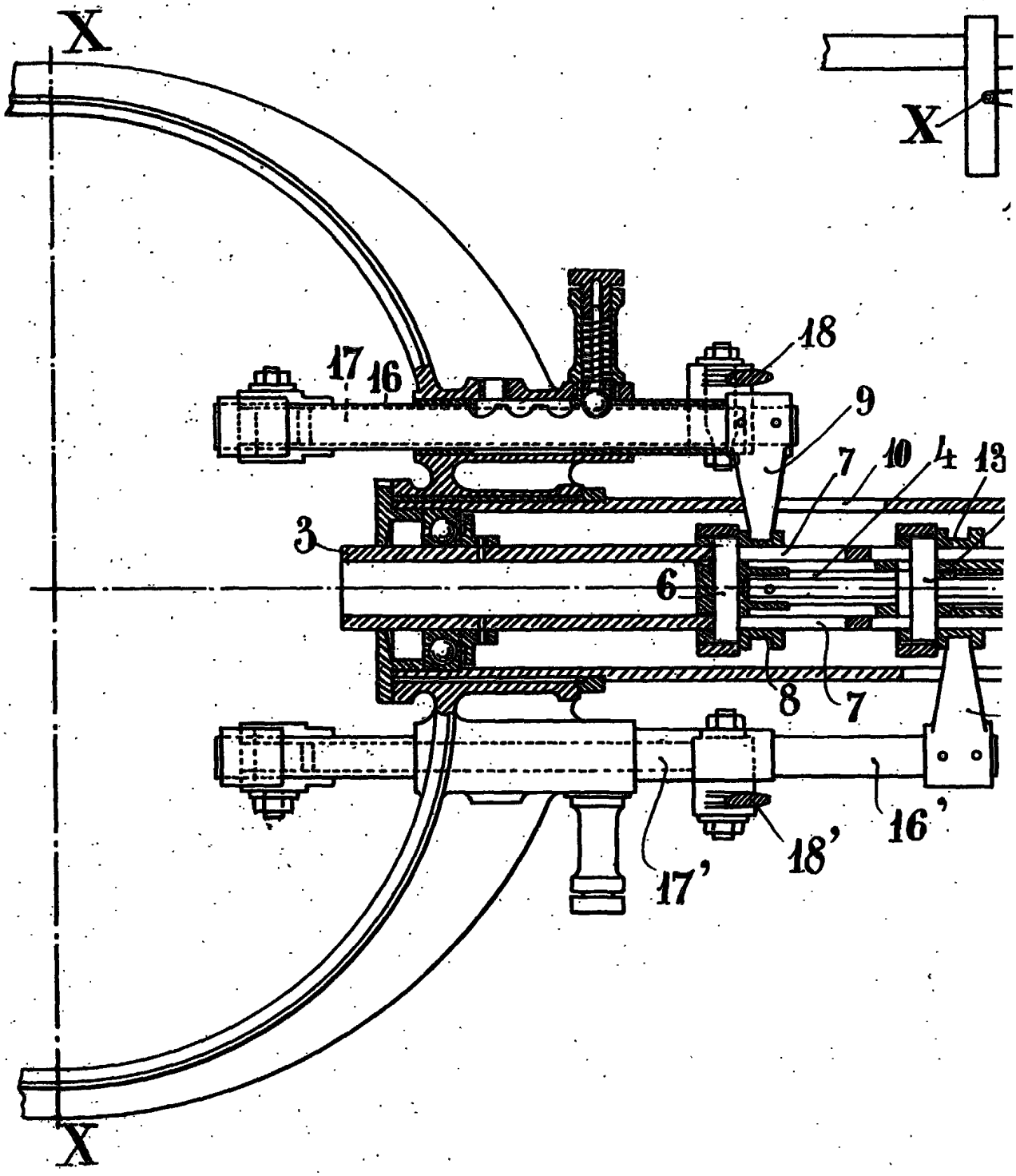

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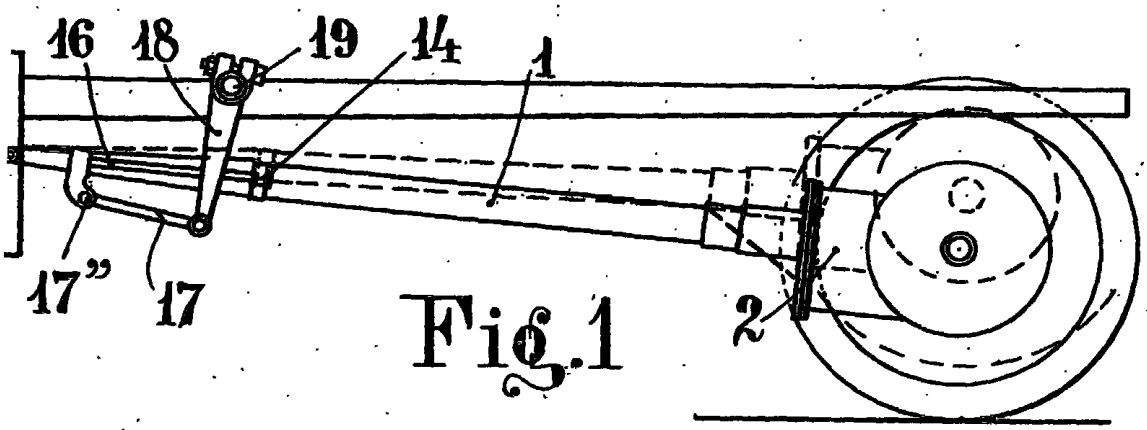

Fig.1

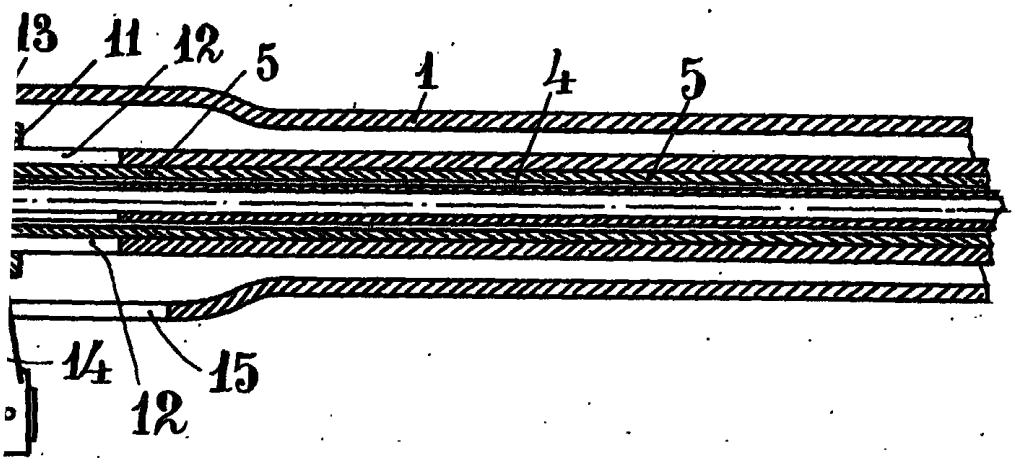

Fig.2

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Fig. 5

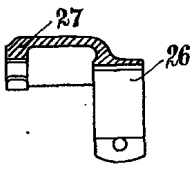


Fig. 6

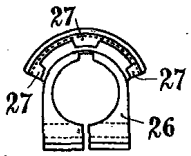


Fig. 7

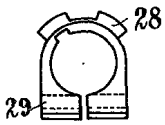


Fig. 8

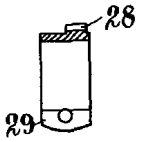
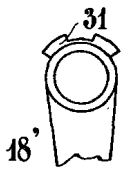
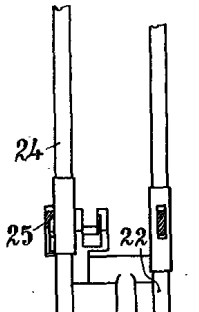


Fig. 9





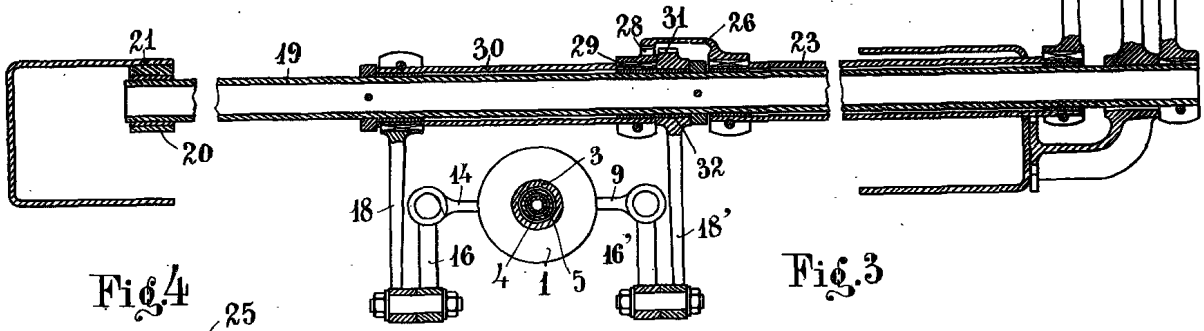


Fig. 3

Fig. 4

Fig. 5

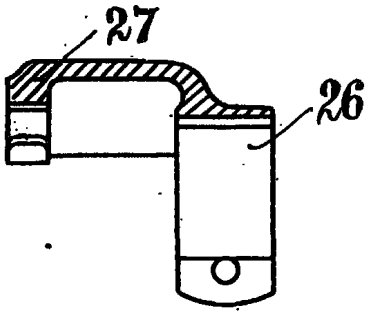


Fig. 6

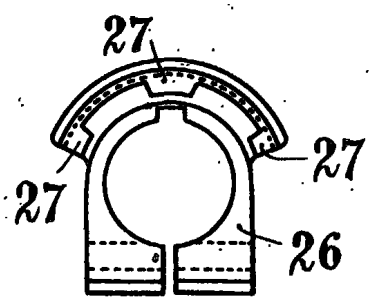
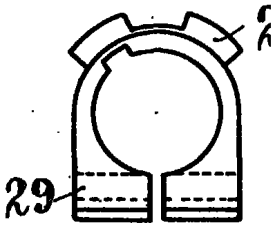


Fig. 7



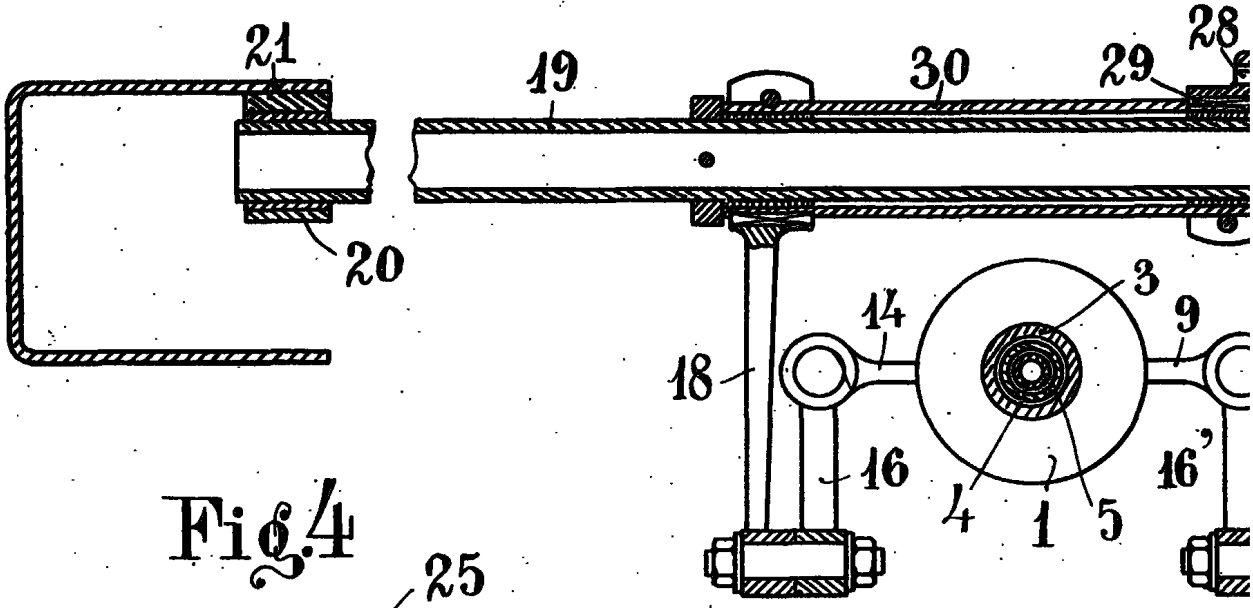


Fig. 4

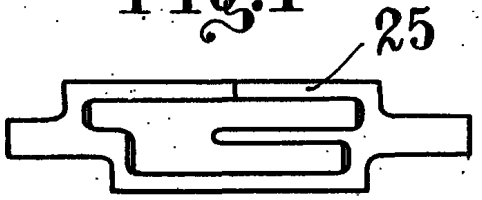


Fig.8

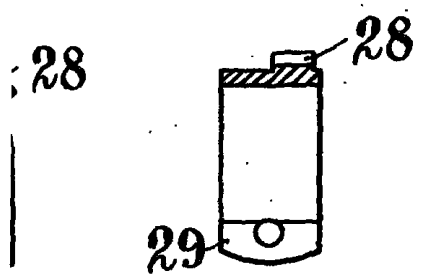
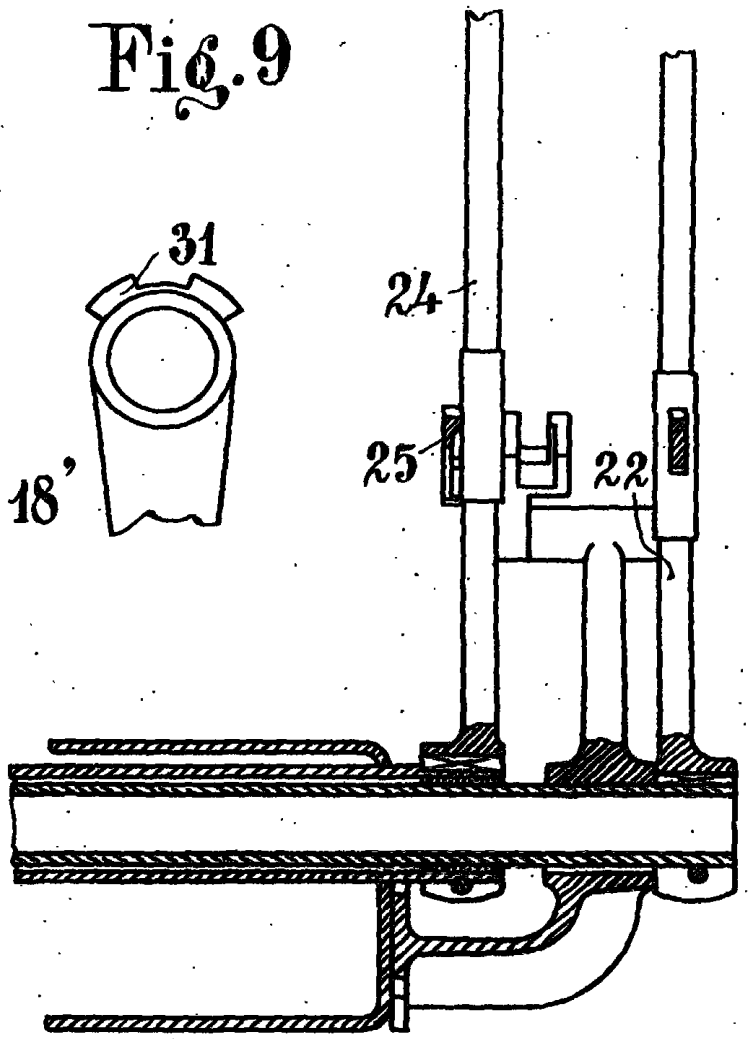


Fig.9



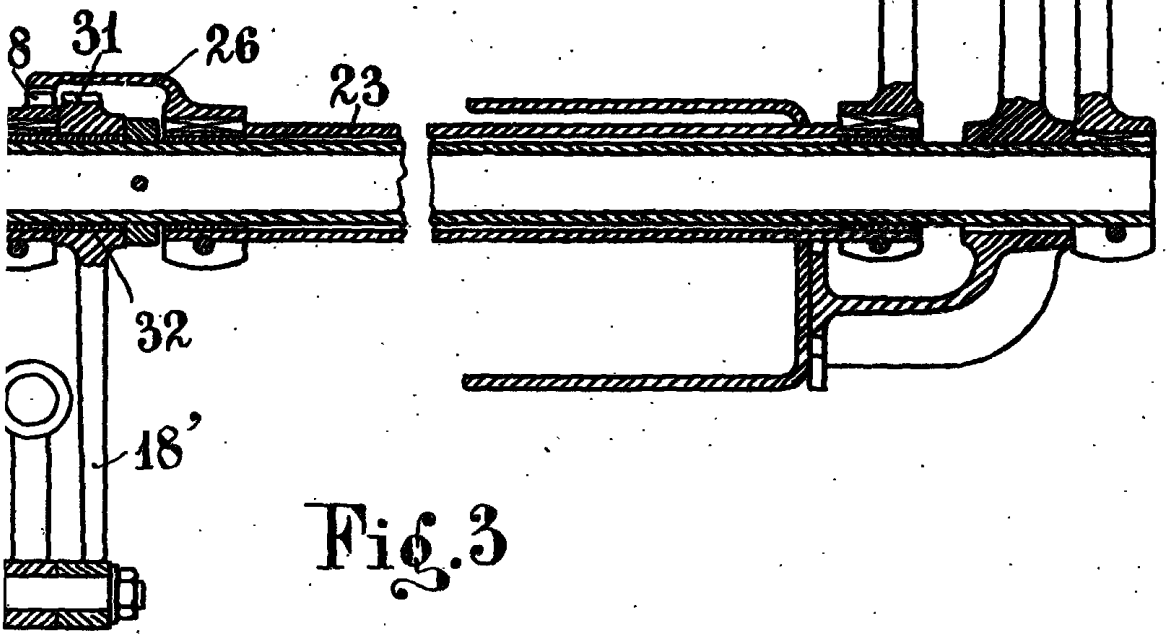


Fig.3

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