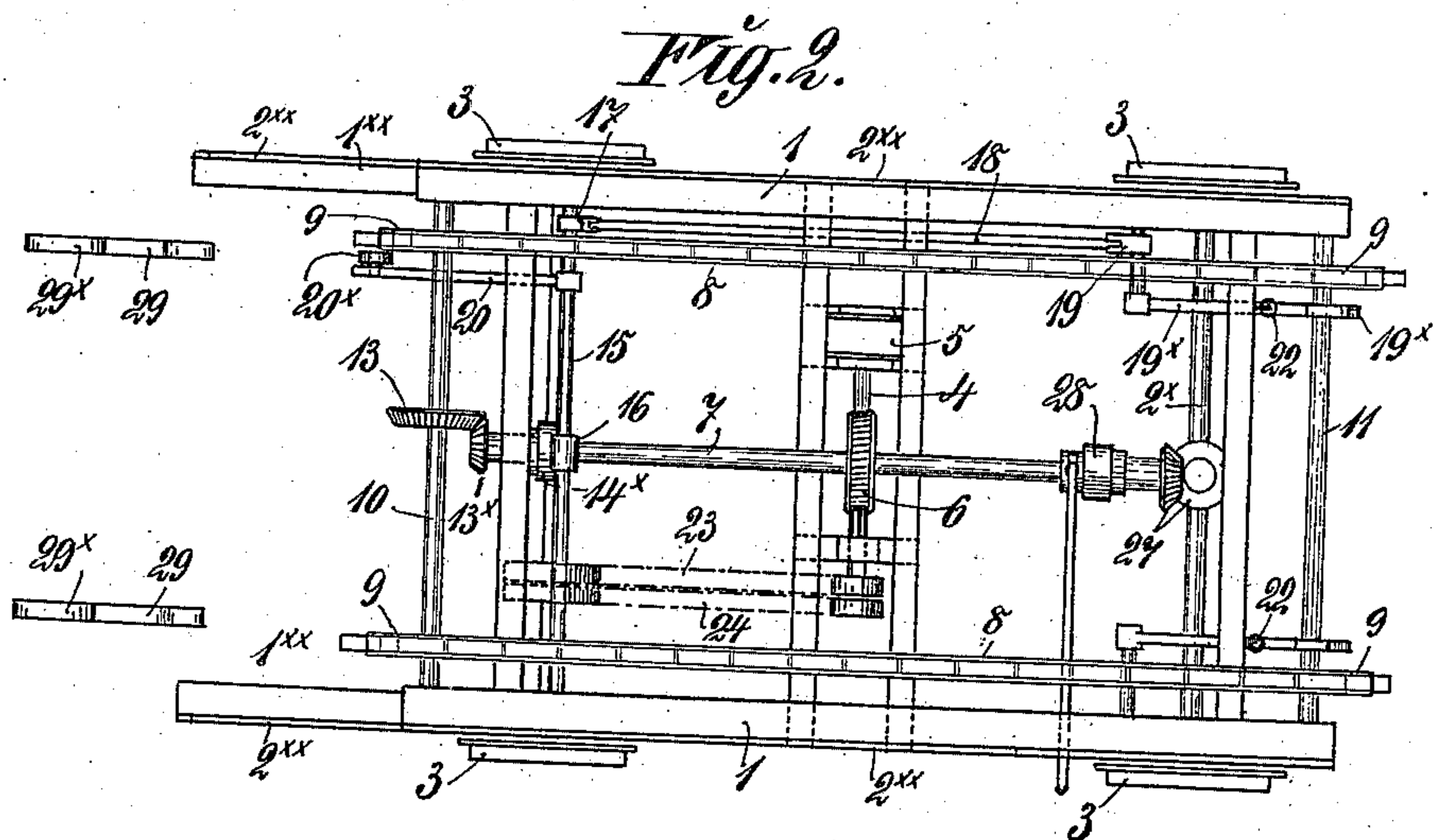
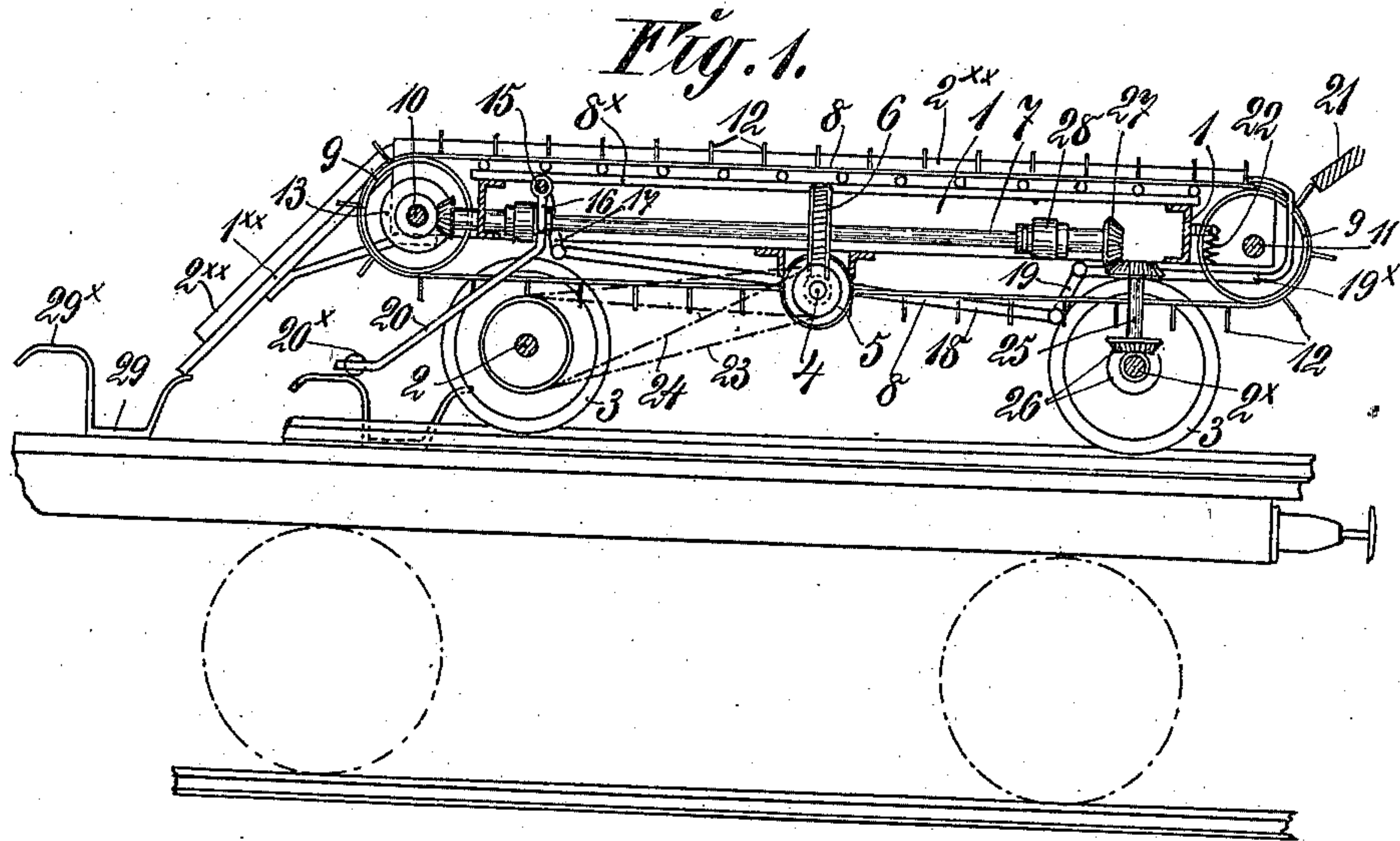


C. G. SMITH.  
MACHINE FOR TRANSPORTING AND LAYING OUT TIES IN THE CONSTRUCTING OF RAILROADS.  
APPLICATION FILED JULY 28, 1910.

989,932.

Patented Apr. 18, 1911.

3 SHEETS—SHEET 1.



Witnesses

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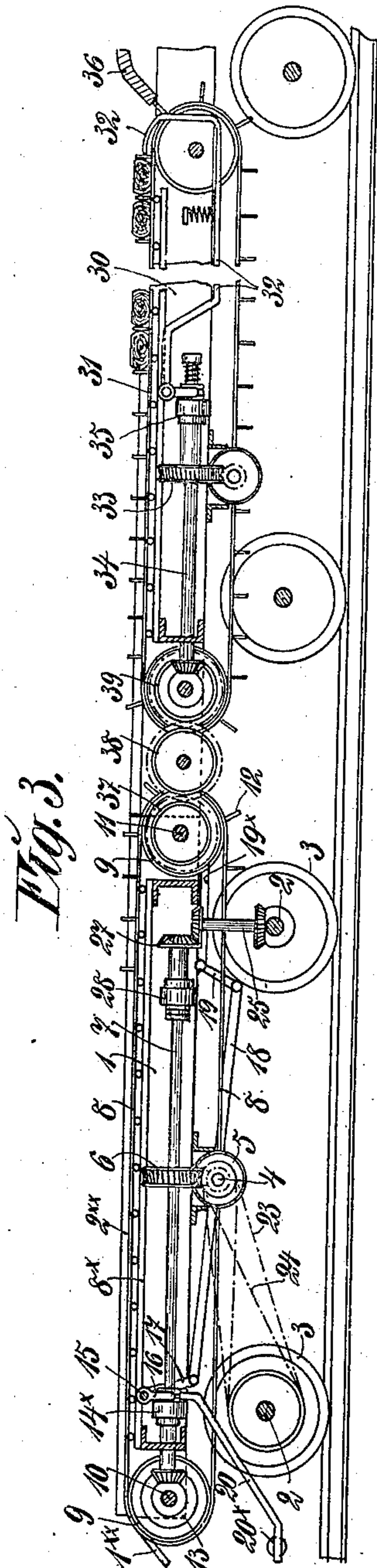


Fig. 3.

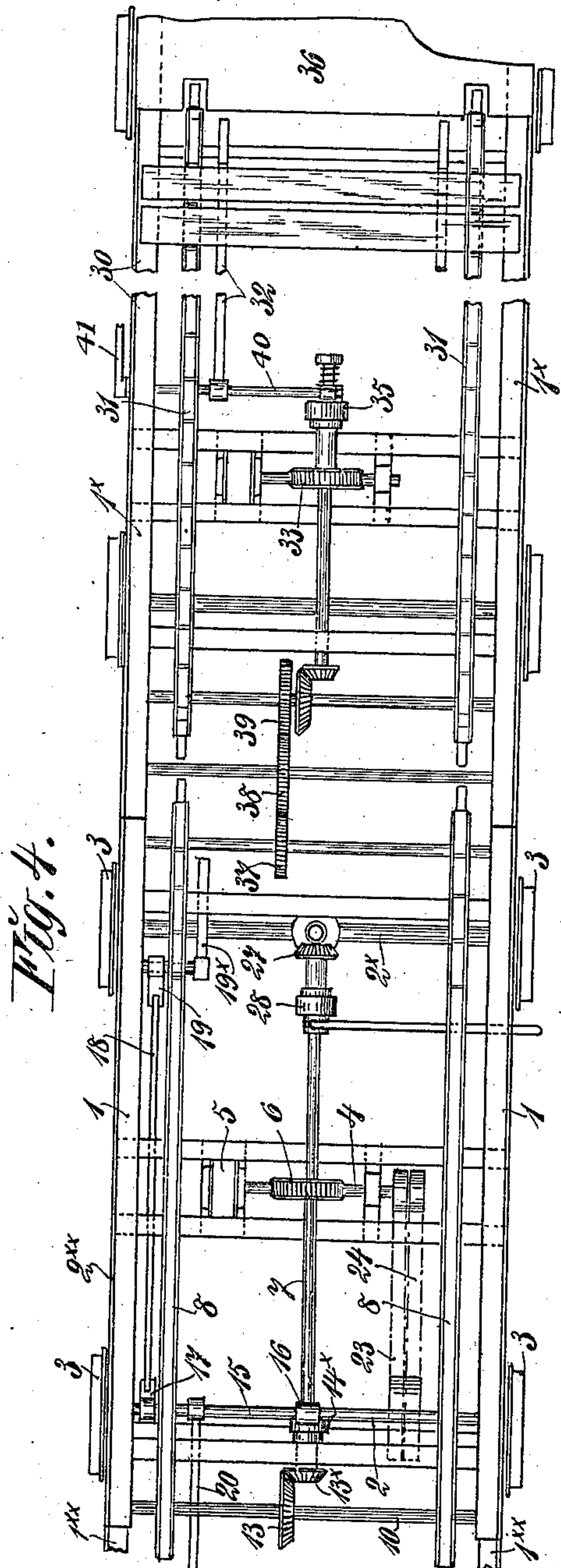


Fig. 4.

Witnesses

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3 SHEETS-SHEET 3.

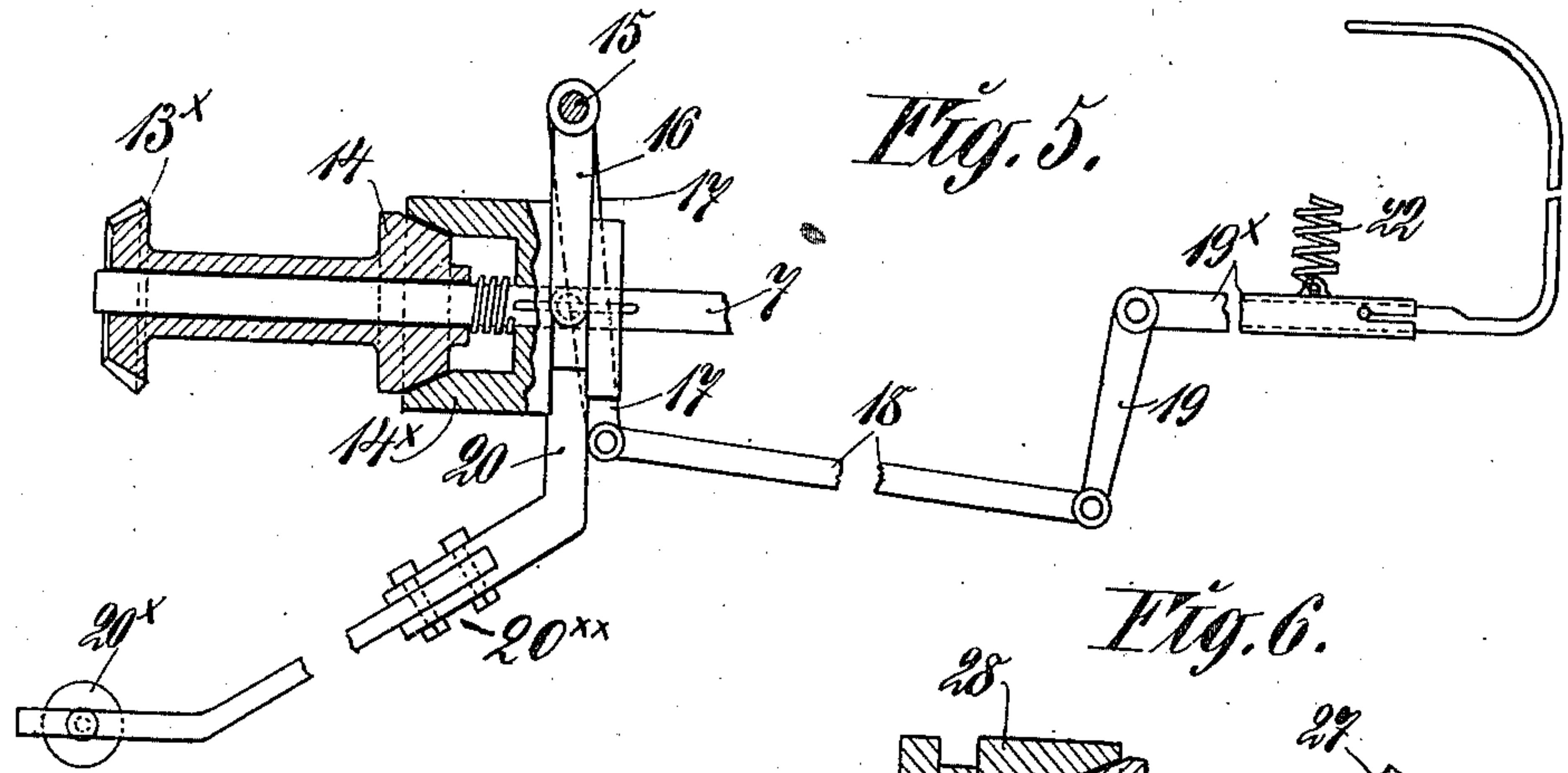


Fig. 5.

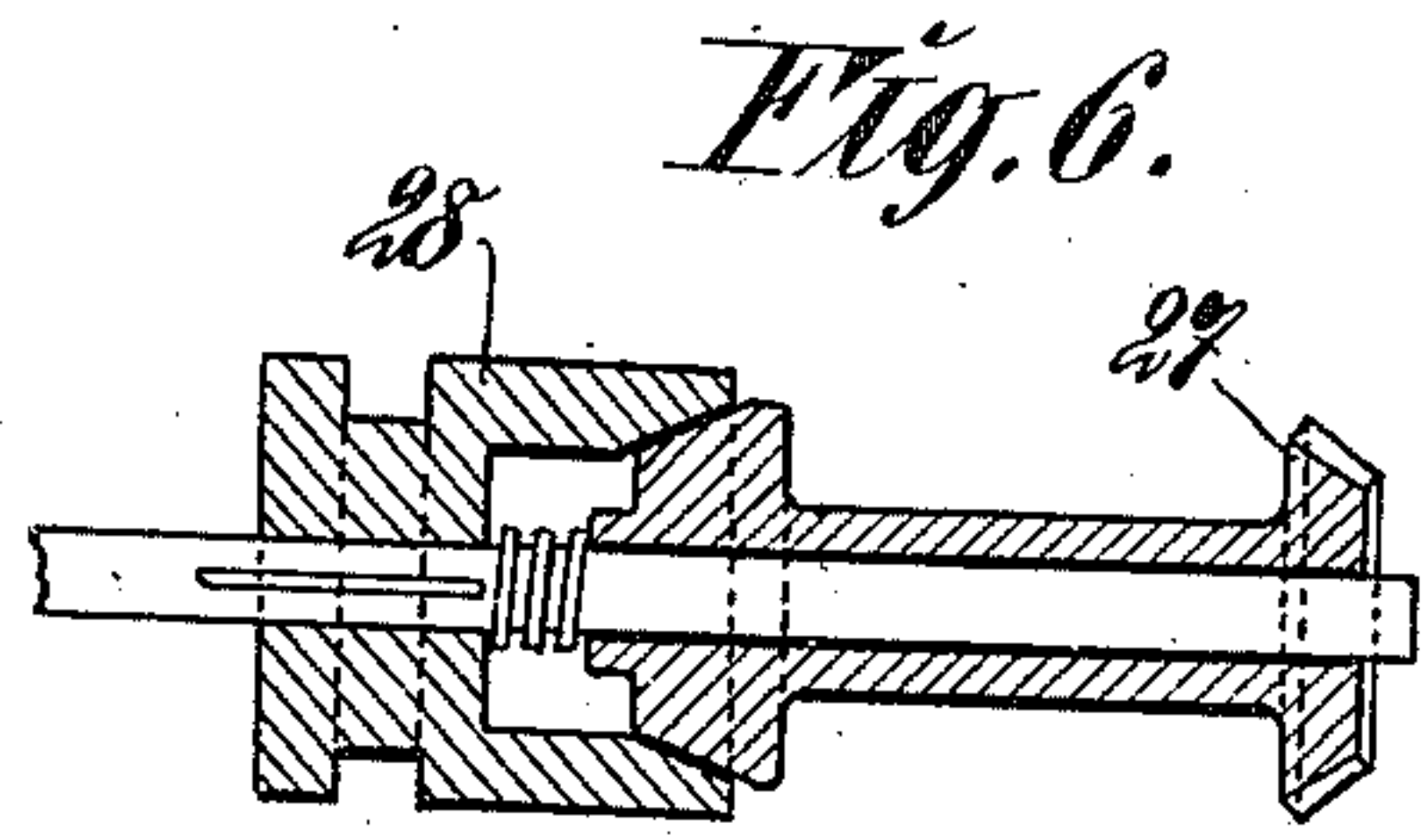


Fig. 6.

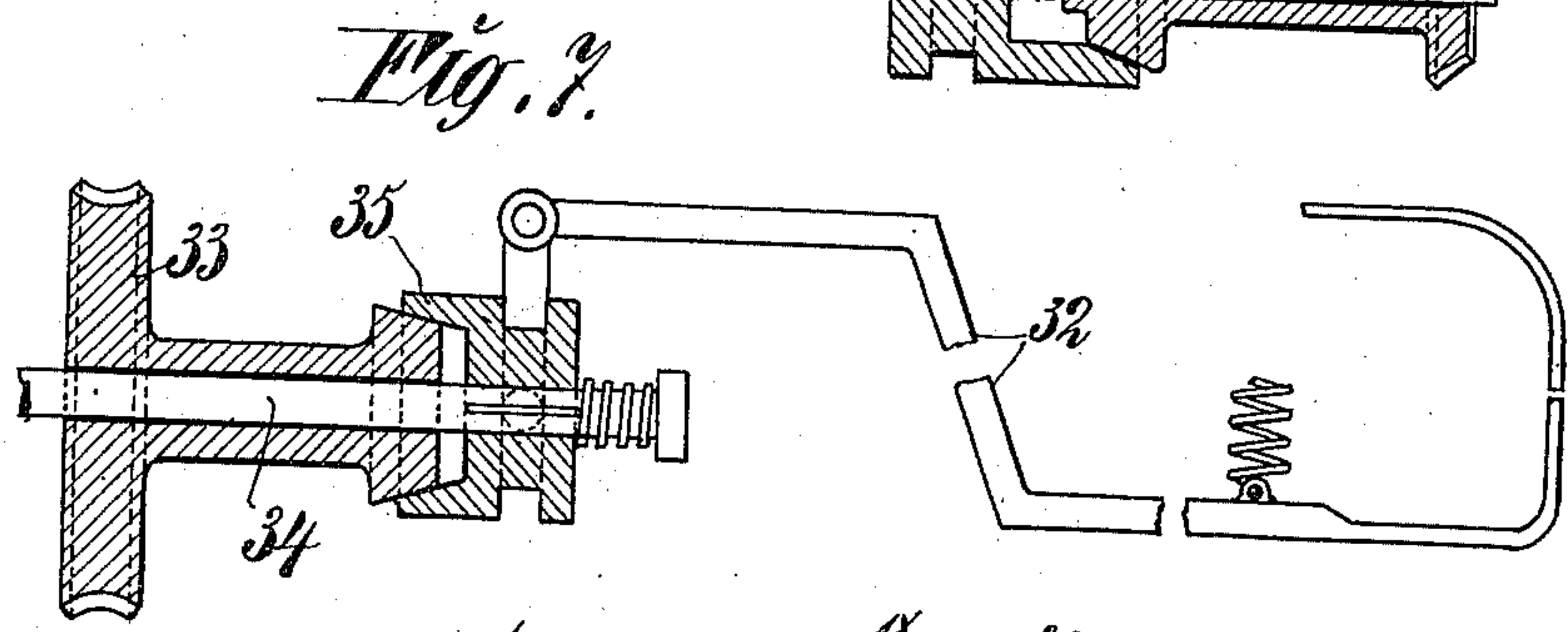


Fig. 7.

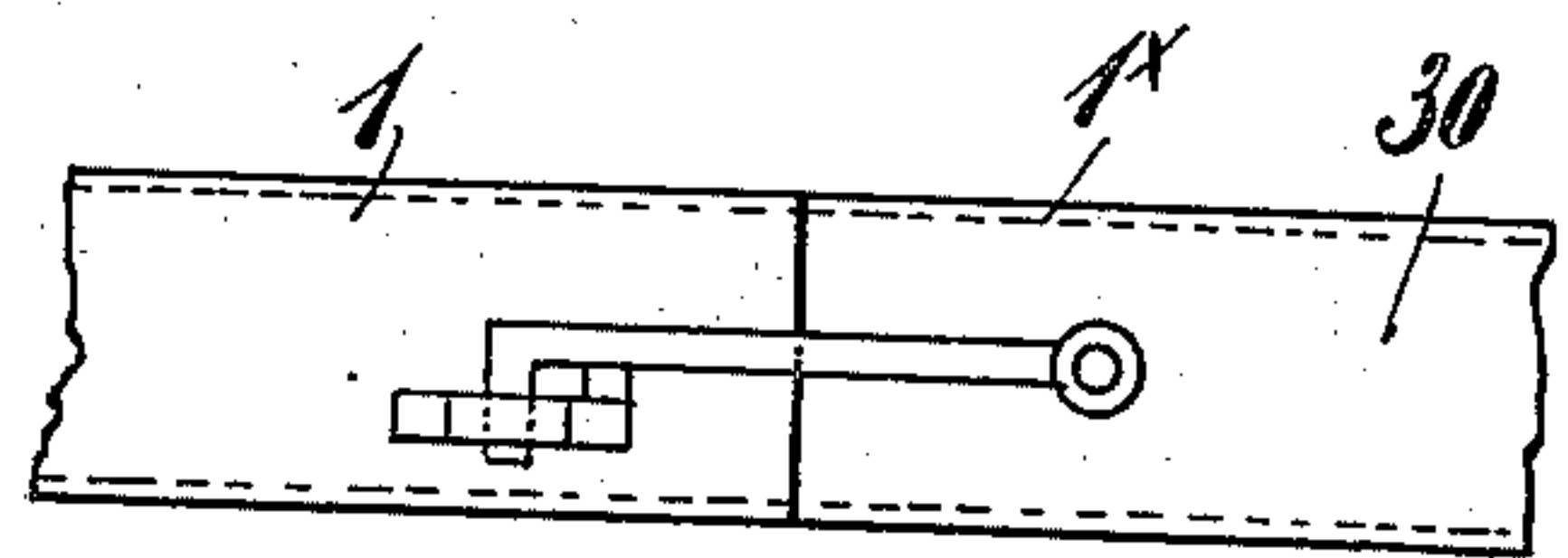


Fig. 8.

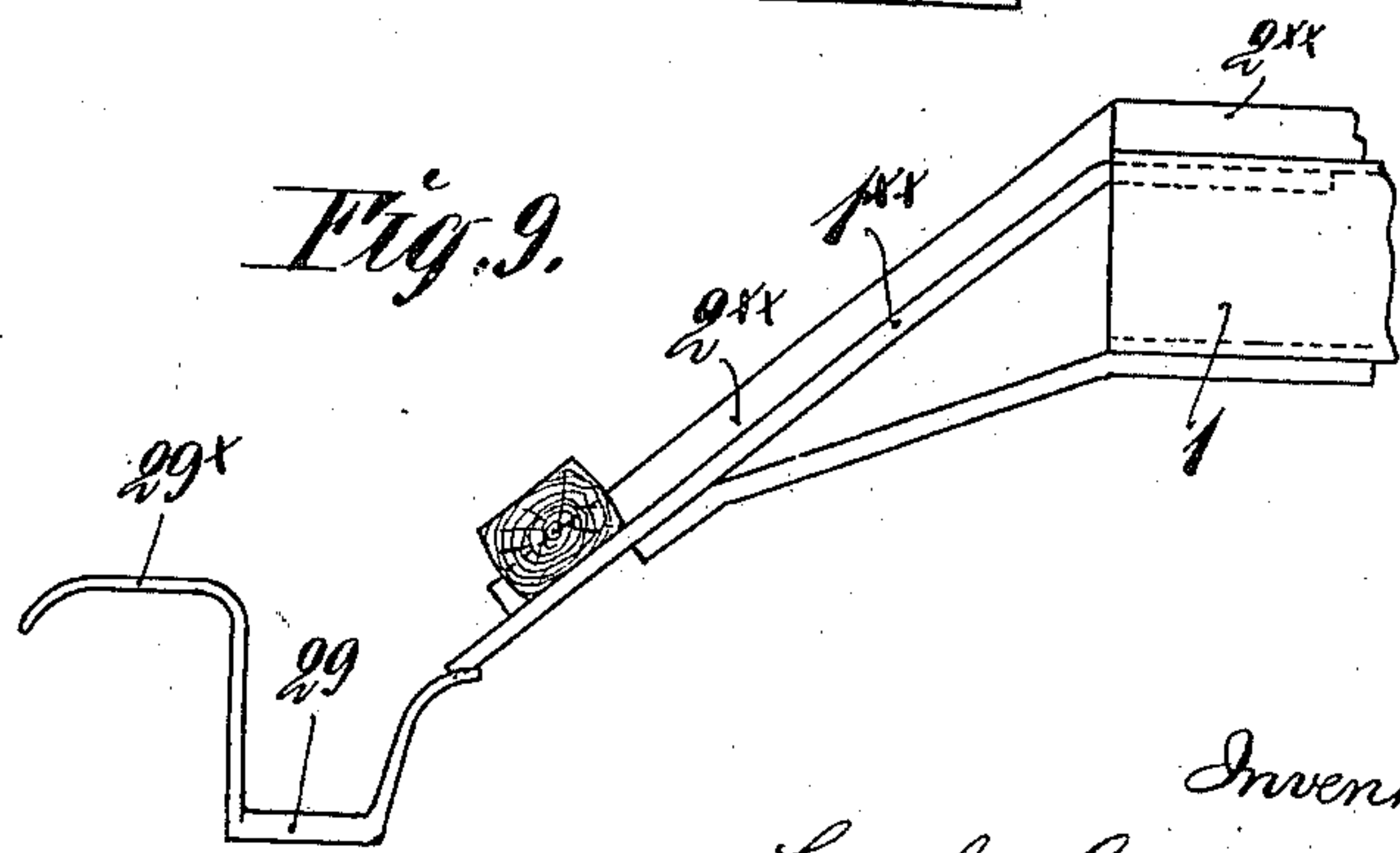


Fig. 9.

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# UNITED STATES PATENT OFFICE.

CARL GUSTAF SMITH, OF STOCKHOLM, SWEDEN.

MACHINE FOR TRANSPORTING AND LAYING OUT TIES IN THE CONSTRUCTING OF RAILROADS.

989,932.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed July 28, 1910. Serial No. 574,229.

*To all whom it may concern:*

Be it known that I, CARL GUSTAF SMITH, a subject of the King of Sweden, and residing at Karlbergsvägen 40, Stockholm, in the Kingdom of Sweden, have invented certain new and useful Improvements in Machines for Transporting and Laying Out Ties in the Constructing of Railroads, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a machine for transporting and laying out the ties in the constructing of railroads and tramways. The said machine is adapted for a rapid moving of the ties from the wagons to a connecting floor or bed provided on a special track laying machine, invented by the applicant, by means of which rails and ties are connected and are then moved from the machine to the road-bed in the shape of track sections, each having the same length as the rail. The said track laying machine is described in the co-pending application Serial No. 556,592, filed April 20, 1910, by the applicant herein and Axel C. Aulin, for an improvement in track laying machines. The said connecting bed is provided with forks, in which the ties are mounted and thus are kept at the proper distances from each other during the spiking operation.

The machine arranged in accordance with this invention comprises a trolley, which is movable on a track, provided between the said wagon and the connecting bed, and is so constructed, that all the ties, necessary for one section, can be loaded on the trolley in such manner, that the ties form a single layer, each tie at the side of the others. The machine with the ties is then moved unto the connecting bed to its front end and is then moved backward. During the movement last mentioned the machine discharges automatically and successively one tie at a time in the said forks, as it is moved past the same. The said trolley is provided with a suitable chain-work for effecting the loading and unloading operations, which extends longitudinally of the trolley and is moved intermittently for loading the ties on the trolley and locating the same in the said forks. The trolley may be combined with an auxiliary trolley of the same construction or it may be used without the said auxiliary trolley. In the case last mentioned the ties are moved directly onto the trolley, which is

then moved to the front end of the connecting bed, but in the case first mentioned, *i. e.* when the trolley and an auxiliary trolley are used, the ties are loaded on the auxiliary trolley, while the other trolley, before loaded with ties, discharges its ties on the connecting bed, the trolley last mentioned being then moved to the auxiliary trolley and is again provided with ties by the ties on the auxiliary trolley being moved to the trolley in one operation. Owing to this arrangement time is saved and the laying out operation can be effected almost continually.

In the accompanying drawings Figure 1 is a side view of the machine provided with only one trolley. Fig. 2 is a plan view of the machine. Fig. 3 is a side view and Fig. 4 a plan view of a machine provided with an auxiliary trolley. Figs. 5, 6 and 7 show clutches. Fig. 8 shows means for connecting the trolleys, and Fig. 9 shows a sliding track.

The trolley has the usual shape and consists of a frame 1, 1 and shafts 2, 2<sup>x</sup> for the running wheels 3, 3. A transverse shaft 4 is journaled at the lower side of the frame, to which shaft the motive power is transmitted preferably from an electric motor 5. The said shaft 4 is connected by a wormgear 6 with a shaft 7 extending longitudinally of the trolley, from which shaft 7 the motion is transmitted to the different parts of the machine by means of clutches. The chain-work consists of two parallel endless chains 8, 8, passing around disks 9, which are fixed to two shafts 10, 11 respectively, journaled in the ends of the trolley. The said shafts 10, 11 are so positioned and the disks 9 have such a width, that the tie, carried by the chains and having a transverse position with relation to the trolley, is supported by the frame 1, which consequently forms a sliding track for the whole tie layer. The said chains 8, 8 are provided with pins 12 between which the ties are located and the top parts of the chains are supported by rollers journaled on ribs 8<sup>x</sup> so that they can not bend downward.

The shaft 7 is connected with the shaft 10 by a bevel gear 13, 13<sup>x</sup>. The pinion 13<sup>x</sup> of the said gear is loosely mounted on the shaft 7 and has a long hub forming the one member 14 of a friction clutch, the other member 14<sup>x</sup> of which is connected with the shaft 7 by means of a key and can be moved longitudinally of the same for connecting the



clutch, when the chain-work is to be actuated, or disconnect the same, as the chain-work is to be stopped, while the shaft 7 is still rotating. The said clutch is connected and disconnected in two different manners. A transverse shaft 15 is journaled in the frame and provided with arms 16, 17 and 20. The arm 16 is connected with the clutch member 14<sup>x</sup>, provided as usual with a groove which is engaged by the fork-shaped arm, Fig. 5. The arm 17 is connected by a link 18 with a bell crank lever 19, 19<sup>x</sup>, which is pivoted to the rear part of the frame 1 and can be acted upon by the tie, when being located on the chain-work, and the third arm 20 is so arranged, that it can be acted upon by the forks mentioned above and provided on the connecting bed. The one, longer arm 19<sup>x</sup> of the said bell crank lever is formed to a semicircle or substantially so and its free end, extending upward and forward, is situated just at the place where the tie is laid down on the chains. The tie is laid down preferably by means of an inclined surface 21 extending from the wagon. The lever arm 19<sup>x</sup> is held in a raised position by a spring 22, the clutch 14, 14<sup>x</sup> being thereby kept in the disconnected position. In the said position of the lever 19, 19<sup>x</sup> its curve shaped arm 19<sup>x</sup> extends upward such a distance with relation to the frame 1, that it is depressed by the tie moved to the chain work. The clutch 14, 14<sup>x</sup> is thereby connected and the chain work is actuated until the tie slides from the arm 19<sup>x</sup>. The spring 22, acting upon the large lever arm 19<sup>x</sup>, then disconnects the clutch 14, 14<sup>x</sup> and so on. The motor while in operation, rotates the shaft 7 continually, but an intermittent movement is imparted to the chain work caused by the ties moved to the same one after the other. The duration of each movement corresponds substantially to the width of the tie and the movement is interrupted, until the next tie is laid on the chain work. In this manner the trolley is filled for its whole length with one layer of ties. In order to prevent the ties from sliding longitudinally the frame 1, 1 is provided at its top side with ribs 2<sup>xx</sup> located outside the ends of the ties and extending longitudinally of the trolley.

The shaft 4 and one of the shafts 2 are connected by two belts 23, 24 indicated diagrammatically by dotted lines or chains for moving the trolley on its track. One of the said belts is crossed, so that the trolley can be moved in both directions on the track. As will be understood any suitable braking device may be employed to stop the trolley and any suitable belt shifter for shifting the belts, neither of which devices however, forms any part of my present invention. The other shaft 2<sup>x</sup> is connected with the shaft 7 by means of an intermediate shaft

25 and bevel gears 26, 27 for moving the machine on the track toward the right in Fig. 1. The pinion of the top gear can be connected with the shaft 7 by means of a clutch 28, Fig. 6, in the same manner as described with reference to the clutch 14, 14<sup>x</sup>, but the clutch 28 is connected and disconnected manually in the ordinary manner by means of a lever. The said gears are so arranged, that the machine can be moved by the same backward, toward the right, comparatively slowly for laying out the ties, while it can be moved at a comparatively great speed between the connecting bed and the wagon by the belt gear. One 29<sup>x</sup> of the shanks of the forks 29, located in a row, one behind the other, is extended upward and has a bent shape forming a bar, located at a suitable level and adapted to raise the lever arm 20, directed forward and located in the same vertical plan as the said forks, by the said arm 20, preferably provided with a roller 20<sup>x</sup>, sliding upon the bar, as the trolley is moved toward the right. The arm 20, thus raised, effects the connecting of the clutch 14, 14<sup>x</sup> and the starting of the chain-work. After the machine has been loaded with a layer of ties in the described manner, it is moved toward the left, to the rear end of the connecting bed by the belt gear, so that the machine will come into a suitable position for the tilting of the ties into the forks 29 successively. In order that the arm 20 may not come into contact with the forks during the said movement, it has a joint 20<sup>xx</sup>, so that it can be turned laterally. The arm is then moved to its normal position. The belt gear is then disconnected and the clutch of the shaft 2<sup>x</sup> connected. The machine is now moved slowly and continually toward the right, Fig. 1. As soon as the lever arm 20 reaches one of the forks 29 and is raised by the same, the clutch 14, 14<sup>x</sup> is connected and the chain-work is moved for a distance corresponding to the width of the tie, while the lever arm passes the fork, owing to which fact one of the ties is tilted from the chain work into the fork. The movement of the machine continues but the chain work is stopped, as soon as the lever arm has passed by the fork, owing to the fact that a spring provided in the clutch, and also the spring 22 disconnect the clutch, as soon as the lever arm is permitted to descend. The next tie is tilted into the next fork 29 and so on. In this manner all the ties are tilted into the forks, whereupon the clutch 28 is disconnected and the machine is returned to its starting position in order to receive the next load and so on. In the connecting bed two forks abreast are provided for each tie.

In order that the tie may not turn around and occupy a wrong position during the unloading operation, the frame 1 is extended



forward by means of ribs 1<sup>x</sup>, forming an inclined track on which the tie slides downward. One of the shanks of the fork is so shaped, that it forms an extension of the  
5 said inclined track, as shown in Fig. 9.

The lever arm 19<sup>x</sup> consists of a tube made in two parts, one slid into the other. Ow-  
ing to the said arrangement the outer part can easily be removed or be drawn some-  
10 what outward out of engagement with a cross pin and be turned sidewise into such a position, that it can not be acted upon by the tie.

If the loading operation must be espe-  
15 cially hastened the ties are not loaded directly on the trolley 1 but an auxiliary trolley 30 is used; the lever arm 19<sup>x</sup> is then moved into its inoperative position. The said auxiliary trolley has a chain-work 31 of the same con-  
20 struction as the one described above and provided on the trolley 1. Also the auxiliary trolley has a lever arm 32, similar to the lever arm 19, 19<sup>x</sup> for connecting the worm wheel 33 with the shaft 34 by means of the  
25 clutch 35, Fig. 7. The trolley 30 is preferably provided with a table 36, from which the ties, one after the other, are moved downward to the chain-work. The ends of the frames 1 and 1<sup>x</sup> of the trolleys respec-  
30 tively facing each other fit snugly to each other, so that the frames form together an even sliding surface for the ties. The trolleys can be connected in a reliable manner by means of hooks, as shown in Fig. 8, or  
35 by any other suitable means. One of the shafts of the chain-work on one of the trolleys is provided with a cylindrical toothed wheel 37 meshing with an idle wheel 38, which, as the trolleys are connected, meshes  
40 with a corresponding wheel 39 provided on one of the shafts of the chain-work of the other trolley, so that the chain-works are actuated simultaneously and at the same speed and in the same direction, while the  
45 ties are tilted from the trolley 1, the trolley 30 is loaded with ties. The emptied trolley 1 is then moved to the trolley 30 and the chain-work of the trolley last mentioned is actuated by depressing the lever arm 32 by  
50 means of a suitable lever 41 secured on the end of the shaft 40 exteriorly of the frame 1. The ties are then moved continually onto the trolley 1. When the ties have been moved over to the trolley 1, the chain-works  
55 are stopped, the trolley 1 is disconnected and moved to the connecting bed, while the trolley 30 is filled with the next layer of ties and so on.

If wanted, the machine may be modified  
60 in such manner, that the motor is stopped automatically, as the tie has passed the lever arm 32, by the lever arm, when depressed, closing an electric contact provided in the circuit of the said motor, which contact is  
65 broken, as the lever arm is raised. This ar-

rangement is, however, not so advantageous owing to the fact that the inertia of the rotating parts makes it difficult to fix exactly the stopping moment, so that the chain-work is not moved behind the desired point, 70  
each time it is stopped.

Two forks abreast are provided on the connecting bed for each tie, but only one of the forks need be arranged for actuating the  
75 arm 20.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine for laying out the ties in the constructing of railroads the combina- 80  
tion of a transporting trolley, a chain-work, provided on the said trolley and extending longitudinally of the same and adapted to contain in one layer all the ties necessary for  
85 a rail-section, a sliding track for the said layer of ties provided on the said trolley, a driving shaft, a clutch for connecting the chain-work with the said driving shaft, and means for connecting the said clutch auto-  
90 matically, as a tie is mounted on the chain-work or the trolley during the unloading operation is moved along a connecting bed provided with fork-shaped projections adapted to receive the ties and to act upon the said  
95 clutch, so that the chain-work is actuated automatically each time the parts have traveled a distance substantially equal to the width of a tie.

2. In a machine for laying out the ties in the constructing of railroads the combination of 100  
a transporting trolley, a chain work provided on the said trolley and extending longitudinally of the same and adapted to contain in one layer all the ties necessary for  
105 a rail length, a clutch provided in the motion transmitting device for the said chain-work, a lever-arm connected with the said clutch, which lever-arm is so positioned and shaped, that it is depressed by the tie, when  
110 being mounted on the chain-work and connects the said clutch, until the chain-work has been moved for a distance substantially equal to the width of the tie and the tie thus has been brought out of contact with  
115 the lever arm, and a spring for disconnecting the clutch.

3. In a machine for laying out the ties in the constructing of rail-roads, the combi- 120  
nation of a transporting trolley, a chain-work provided on the said trolley and extending longitudinally of the same, the said chain-work being adapted to contain a plurality of ties in one layer, a sliding track for the said layer provided on the trolley,  
125 a clutch provided in the motion transmitting device for the said chain-work, a lever-arm connected with the said clutch and adapted to connect the same and for being acted upon periodically by projections provided on the  
130 connecting bed, on which the ties will be



placed, as the trolley is moved along the said bed for tilting a tie at a time from the chain-work, and a clutch in the said motion transmitting device adapted to connect a  
5 gear, actuating the trolley, at the same time as the chain-work is actuated.

4. In a machine for laying out the ties in the constructing of railroads the combination of a transporting trolley, a chain-work  
10 and a sliding track provided on the same, adapted to place the ties on the trolley and to move the same longitudinally of the trolley, gears, connected with a driving shaft for actuating the chain-work and the trolley  
15 respectively, so that a comparatively rapid and a comparatively slow motion is imparted to the trolley, and clutches for connecting the chain-work intermittently, without the trolley being actuated, or for actuating the  
20 chain-work at the same time as the trolley is moved slowly.

5. In a machine for laying out the ties in the constructing of rail-roads the combination of a transporting trolley, a chain-work  
25 provided on the same for loading the ties on the trolley and moving them on the same, gears and clutches for actuating the chain-work intermittently and the trolley simultaneously or the trolley alone by means of  
30 a driving shaft, means for connecting the clutch of the chain-work automatically at the mounting of the tie or by the trolley passing forks, adapted to receive the ties and provided on a connecting bed, on which  
35 the ties and rails are connected, and an in-

clined track, on which the tie can slide from the trolley to the connecting bed and into the forks.

6. In a machine for laying out the ties in the constructing of rail-roads the combination of a transporting trolley, a chain-work adapted to receive the ties and to move them longitudinally of the same, an auxiliary trolley, which is provided with a similar chain-work and, when connected with  
45 the trolley first mentioned forms with the same a sliding track, on which the ties can be moved from one of the trolleys to the other, a clutch provided on the auxiliary trolley and in the motion transmitting device for the chain-work, and a lever-arm connected with the said clutch, which lever arm is acted upon by the tie, when being mounted on the trolley, in such direction,  
50 that the clutch is connected and the chain-work moves the tie out of contact with the said lever arm, and a gear for actuating both the chain works, in order that the auxiliary trolley may be loaded with ties, while the other trolley is unloaded and that the  
60 trolley last mentioned then may be loaded rapidly by the ties being moved to the same from the auxiliary trolley.

In testimony whereof I have affixed my signature in presence of two witnesses.

CARL GUSTAF SMITH.

Witnesses:

HEDING MELINDER,  
ROBERT APELGREN.