

Oct. 19, 1926.

F. TÖPFL

1,604,089

MACHINE FOR TESTING SPRINGS

Filed Nov. 4, 1925

3 Sheets-Sheet 1

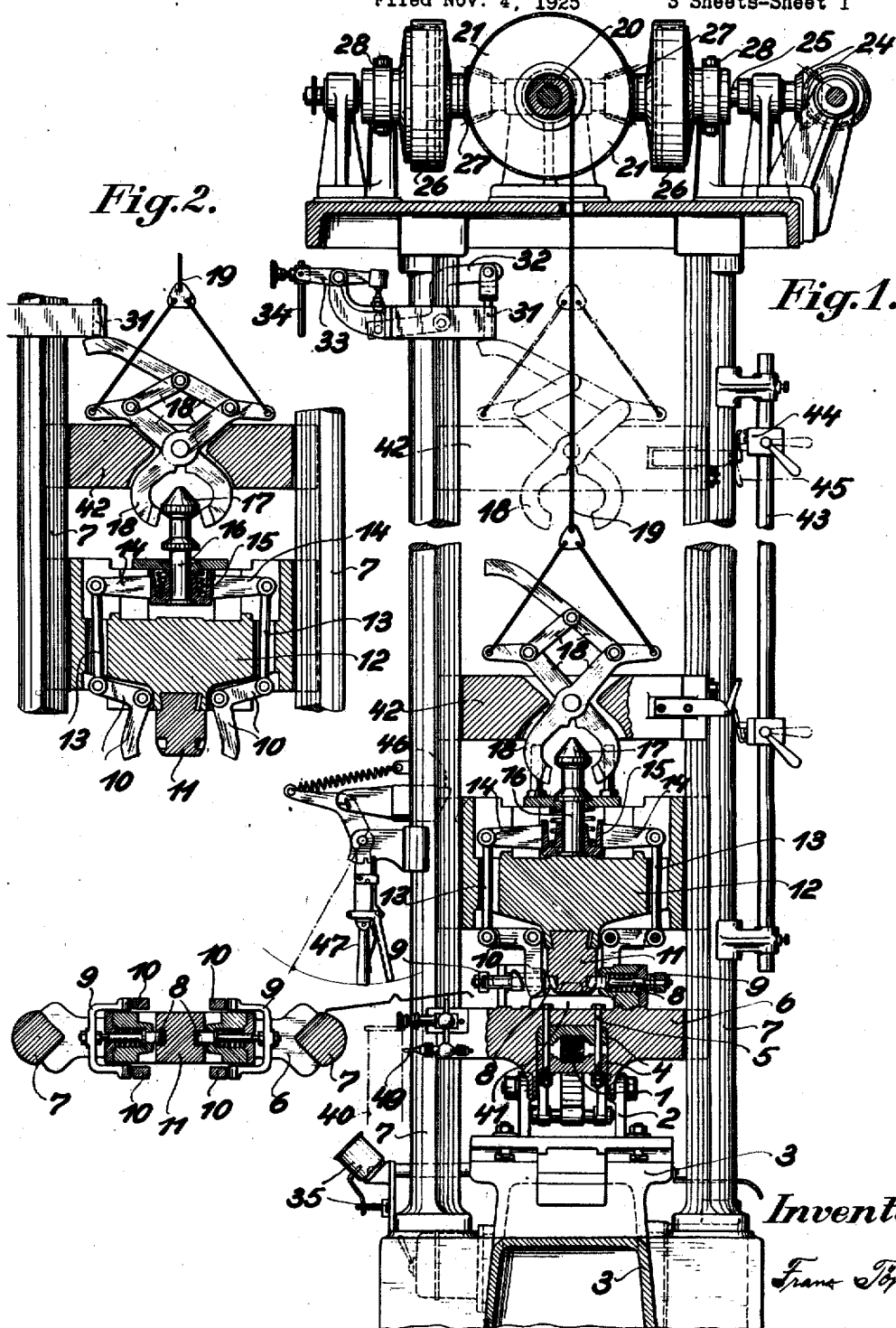


Fig. 2.

Fig. 1.

Inventor

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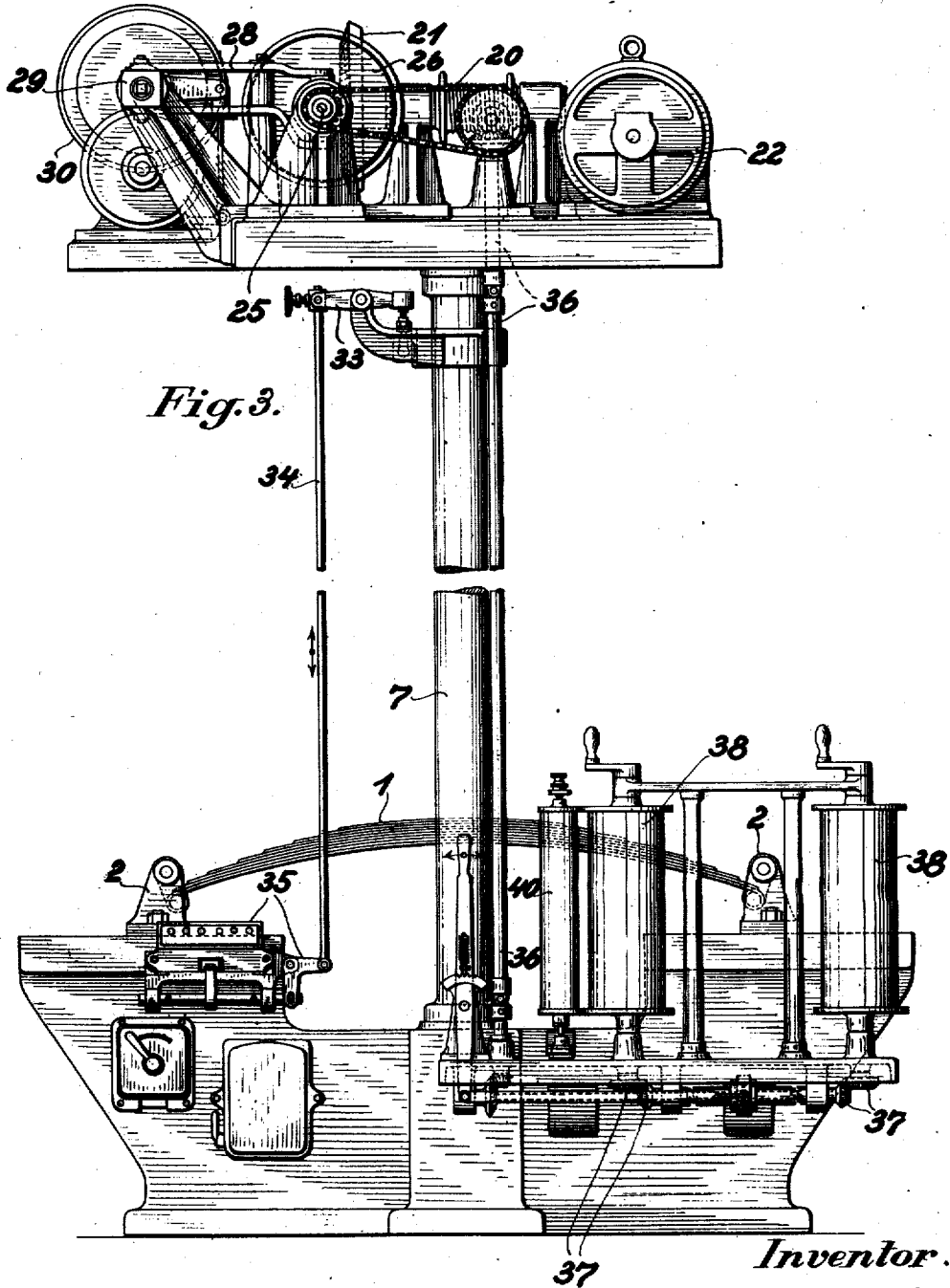
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Fig. 4.

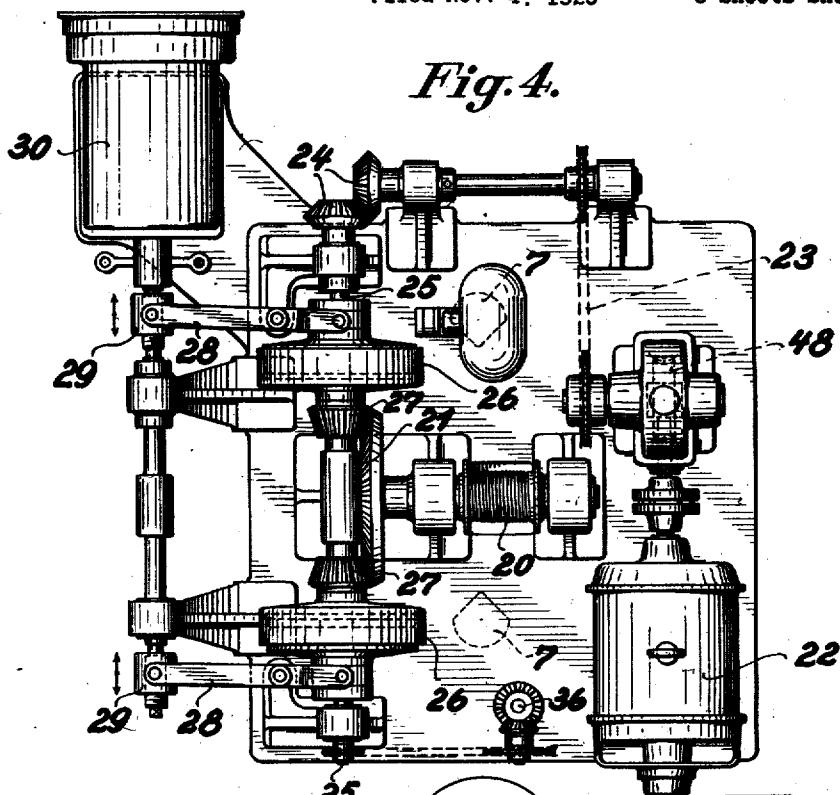
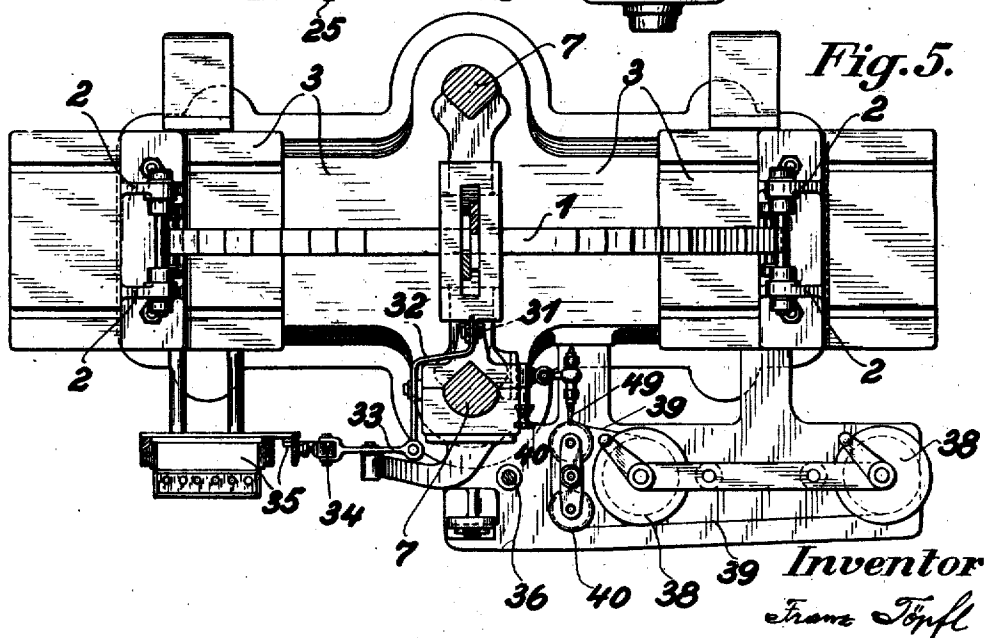


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANZ TÖPFL, OF DUSSELDORF-OBERCASSEL, GERMANY.

MACHINE FOR TESTING SPRINGS.

Application filed November 4, 1925, Serial No. 66,752, and in Germany August 30, 1924.

My invention relates to improvements in machines for testing springs and relates particularly to springs used for vehicles of all kinds. According to my invention the spring is set in vibration by impact, the falling weight producing this oscillation partaking in it by means of coupling. Thus the spring is tested under the conditions in which it is strained in actual use, as in the action of springs for automobiles and other swinging in connection with the whole mass of the carriage-body.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawings. In said drawings,

Fig. 1, and 2, are vertical sections.

Fig. 3, is a side view.

Fig. 4 is a plan view.

Fig. 5 is a horizontal cross section.

The spring to be tested 1, is placed between the adjustable trestles 2 on the bed 3 and connected by means of the jaws 4 and the bolts 5 with an anvil 6 guided between the vertical pillars 7 in such a manner as to be able of partaking in the oscillations of the springs. Two snap-bolts are provided on the anvil opposite each other, bearing bows by means of which they can be withdrawn with the help of the bent levers 10. The bolts engage in the exchangeable head 11 of the hammer or falling weight 12, which is also guided along the pillars. The bent levers 10 which are borne by the hammer or falling weight are connected by rods 13 provided with arms 14 to a socket 15 which is kept in place by the bolt 16. This latter has a bevelled head 17 over which may glide a pair of tongs 18 which are guided in the pillars 7 by means of a slide 42. The tongs are attached to a rope 19 passing round the drum 20 which is put in motion by the adjustable bevelled driving gear 21. A motor 22 puts the axle 25 of the adjustable driving gear in motion by means of the worm 48, the chain 23 and the bevelled wheels 24. Two friction couplings 26 engage one or the other of the bevelled wheels 27 in the adjustable driving gear. These couplings are moved by levers 28, connected by means of nuts 29 with the axle of a motor-magnet 30. Both the nuts have the same thread so that when the axle turns in one direction or other one coupling is engaged while the other is disengaged. In their highest position a

releasing lever 18' carried by the tongs 18 knock against a bolt 31 which by means of a bent lever 32 moves the lever 33 to which is attached a rod 34 which sets the counter 35 going. The axle 25 sets a vertical axle 36 in motion which by means of the bevelled wheels 37 sets the two drums 38 in rotary motion so that a sheet of paper 39 is passed over the guiding pulleys 40 from one drum to the other; while a pencil or other marking instrument mounted on and movable with anvil 6 records the oscillation curve of the spring.

When the tongs 18 are drawn up by the drum 20, they carry the falling weight with them, until in their highest position the tongs open, by contact of lever 18' with pin 31, allowing the falling weight to drop with its impact-face 11 which is made of rubber or hard wood on the anvil connected with the spring thus causing it to oscillate, the oscillations being marked by the pencil or other recording means. The hammer or falling weight is coupled to the anvil by means of the snap-bolts 8, the hammer or falling weight by gravital and rebounding movements thus partaking in the oscillations. When the tongs go down, they engage the head 17 so that when it goes up it takes the falling weight with it. But before that happens the socket 15 is raised and by means of the bent levers 10 engaging behind the bows 9 the snap-bolts 8 are withdrawn from the falling weight, thus disconnecting the coupling between the anvil and weight and allowing the latter to be taken up by the tongs. The electric current for the motor-brake-magnet which couples the adjustable driving gear can be automatically switched by means of the adjustable circuit closing contacts 44 provided on the rod 43 and engaged by a coacting contact provided on the slide 42.

The hammer or falling weight can be fixed in its highest position by means of a clutch pin or stop 46 in order to prevent it from falling down, while a spring is being inserted for test. A hand lever 47 is used to withdraw the clutch.

While in describing the invention reference has been made to a particular example embodying the same I wish it to be understood that my invention is not limited to the construction shown in the drawing, and that various changes may be made in the

general arrangement of the apparatus and the construction of its parts within the spirit of the appended claims and without departing from the invention.

I claim:

1. A machine for testing springs comprising means for supporting a spring to be tested, a falling weight operative by impact on the spring to set the spring into oscillation, and means for constantly opposing the resistance of the weight to the oscillations of the spring during the oscillation period of the latter.

2. A machine for testing springs comprising means for supporting the ends of a spring, an anvil adapted to be fastened to the spring, a hammer for delivering a blow to the anvil for setting the spring into oscillation, and means for coupling the hammer to the anvil during the oscillation period.

3. A machine for testing springs comprising means for supporting a spring, an anvil adapted to be fastened to the spring, a hammer for delivering a blow to the anvil to set the spring into oscillation, coupling means for connecting the hammer with the anvil during the period of oscillation, and hammer raising and lowering means provided with an automatic gripper to engage a part of said coupling means and operative on a lifting movement of the hammer thereby to release said coupling means.

4. A machine for testing springs comprising means for supporting a spring, a drop weight for setting the spring into oscillation, a lifting device for raising the weight, and a recorder responsive to the oscillations of the spring and adjustable by said lifting device.

5. A machine for testing springs comprising means for supporting a spring, a drop hammer for setting the spring into oscillation, a lifting device for raising the hammer, gearing for operating said device, a marking device movable with the spring in its oscillations, a coating movably mounted recording strip, and means for imparting motion to said strip from said drive gearing during the oscillating period of the spring.

6. A machine for testing springs comprising means for supporting a spring at its ends, a movable anvil adapted to be secured to the spring intermediate its ends, a drop hammer for coaction with the anvil to cause the spring to oscillate, and means for indicating the extent of the spring oscillation.

7. A machine for testing springs comprising means for supporting the ends of a spring, a movable anvil adapted to be secured to the spring centrally of its length, a drop hammer for coaction with the anvil

to cause oscillation of the spring, means for automatically coupling the hammer to the anvil to adapt the hammer to partake of the oscillations of the spring as a result of its impact action, and means for indicating the extent of the spring oscillations.

8. A machine for testing springs comprising means for supporting the ends of a spring, a movable anvil adapted to be secured to the spring centrally of its length, a drop hammer for contact with the anvil to cause the spring to oscillate, spring actuated coupling means for automatically coupling the hammer to the anvil at the impact moment, means for indicating the spring vibrations, and means for raising and lowering the hammer, said means being operative for releasing said coupling on a hammer lifting movement.

9. A machine for testing springs comprising means for supporting the ends of a spring, a movable anvil adapted to be secured to the spring centrally of the latter, a drop hammer for coaction with the anvil to cause the spring to oscillate, means for coupling the hammer to the anvil for oscillating movements therewith and with the spring following the impact moment, and means for raising and lowering the hammer, said means including connections for releasing the coupling at the beginning of the hammer lifting movement.

10. A machine for testing springs comprising means for supporting the ends of a spring, an anvil for backing the spring intermediate of its length, a drop hammer coacting with the anvil for setting the spring into oscillation, interconnecting means for causing the spring, anvil and hammer to oscillate in unison following the hammer impact, indicating means for indicating the spring oscillations, and hammer raising and lowering mechanism including means for releasing the hammer for upward movement.

11. A machine for testing springs comprising means for supporting the ends of a spring, a movable anvil adapted to be secured to the intermediate portion of the spring, a drop hammer for coaction with the anvil to cause the spring to oscillate, latch means on the anvil, coating latch means on the anvil and hammer being automatically engageable to couple the same together on the down stroke of the hammer, hammer raising and lowering mechanism, and engaging means between the same and the hammer, operative on the upward movement of said raising and lowering means to disengage the latch means on the hammer from the latch means on the anvil and to couple said hammer to said raising and lowering means.

12. A machine for testing springs comprising means for supporting the ends of

a spring, a drop hammer for delivering a blow to the spring to set the spring into oscillation, and means for indicating the extent of the oscillations.

- 5 13. A machine for testing springs comprising means for supporting the ends of a spring, a drop hammer operated by impact to set the spring into oscillation, means

for coupling the hammer to the spring during the oscillating movements of the latter, 10 and means for indicating the extent of the oscillations.

In testimony whereof I affix my signature.

FRANZ TÖPFL.

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FRANZ TÖPFL.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,604,089, granted October 19, 1926, upon the application of Franz Töpfl, of Dusseldorf-Obercassel, Germany, for an improvement in "Machines for Testing Springs," an error appears requiring correction as follows: In the heading to the printed specification, line 5, date of filing application in Germany, for August 30, 1924, read *October 30, 1924*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 21st day of December, A. D. 1926.

[SEAL.]

M. J. MOORE,
Acting Commissioner of Patents.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,604,089, granted October 19, 1926, upon the application of Franz Töpl, of Dusseldorf-Obercassel, Germany, for an improvement in "Machines for Testing Springs," an error appears requiring correction as follows: In the heading to the printed specification, line 5, date of filing application in Germany, for August 30, 1924, read *October 30, 1924*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 21st day of December, A. D. 1926.

[SEAL]

M. J. MOORE,
Acting Commissioner of Patents.