

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Automatic Coupling for Toy Railways

5 We, MECCANO (FRANCE) LIMITED, of 236, Binns Road, Liverpool, 13; a British company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention concerns a universal automatic coupling for model railways.

There are in use today several very differently constructed coupling systems for model railways. The most popular are:

15 Couplings according to the system known under the Registered Trade Mark "Marklin".

Coupling according to the system known under the Trade Mark application "Fleischmann".

20 Coupling according to the system known under the Registered Trade Mark "Trix".

Each of these types of couplings can be coupled only with a coupling of the same type. In accordance with the technical conception of the individual coupling systems, it is not possible to use the three said systems freely with each other. Thus for example a carriage fitted with a "Fleischmann" coupling cannot be coupled with one which is provided with a "Marklin" or "Trix" coupling, even if the gauge and construction standard of both vehicles are identical.

35 An object of the present invention is to provide a coupling which combines in a simple manner, the constructional features of the three "Marklin", "Fleischmann" and "Trix" systems in a single automatic coupling which can be freely used with the products of all the three aforementioned systems.

40 The coupling envisaged is not just a kind of transition or connecting piece to these three systems, but one which can also be used independently of them for coupling model railway vehicles generally.

45 The possible uses of vehicles fitted with one or other of the previous systems can be

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considerably extended thereby, whilst a model vehicle fitted with the coupling of the present invention can be coupled and used without any limitations with all vehicles of the "Marklin", Fleischmann" and "Trix" systems and any other system as required. 50

According to the present invention a universal coupling is characterised by a coupling member which terminates at one end in an upwardly directed hook and at the other end has means for securing to a vehicle, also by a shackle link pivotally journalled in eyes of the coupling member and by a draw hook in the form of a bell-crank lever which is pivotally journalled at its apex, at least one member being provided for the co-axial mounting of the shackle link and the draw hook. 55 60

The invention will now be described further, by way of example, with reference to the accompanying drawings, in which:— 65

Fig. 1a is a side elevation of a coupling member constructed in accordance with the invention;

Fig. 1b is a perspective view of the coupling member; 70

Fig. 2a is a side elevation of a shackle link;

Fig. 2b is a perspective view of the shackle link; 75

Fig. 3a is a side elevation of a draw hook;

Fig. 3b is a perspective view of the draw hook;

Fig. 4 is a side elevation of the coupling; 80

Fig. 5 is a plan view of the coupling;

Fig. 6 is a perspective view of the coupling;

Fig. 7a, 7b and 7c show the interlocking stages of operation of a coupling constructed in accordance with the present invention when used with a coupling of similar type; 85

Fig. 8a, 8b and 8c show the interlocking stages of the operation of the coupling when

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used with a coupling of the "Marklin" system;

Figs. 9a, 9b and 9c show the interlocking stages of the operation of the coupling when used with a coupling of the "Fleischmann" system; and

Figs. 10a, 10b and 10c show the interlocking stages of the operation of the coupling when used with a coupling of the "Trix" system.

The coupling shown in Figs. 4, 5 and 6 comprises the following parts:

A coupling member K of the type shown in Fig. 1a;

A shackle link L of the type shown in Fig. 2a;

A draw hook Z of the type shown in Fig. 3a;

A member S in the form of a pivot pin for the co-axial mounting of shackle link L and draw hook Z.

The coupling member K consists of a single member, for example, a stamped part of sheet metal or a die casting of synthetic thermoplastics material. One end of the coupling member K is constructed as a hook 1 and serves to couple with couplings of the "Marklin" system. The coupling member K has two lugs 2 turned up in parallel, each having an eye 3 with shoulders 4 extending at a right angle to the lugs 2 for supporting the shackle link L and the draw hook Z. The other end of the coupling member is formed as a flange 5 and serves for the attachment of the coupling by means of screws, pin or rivet to the vehicle. The flange 5 can be constructed in various forms, so that the entire coupling can be secured to the vehicle according to the particular construction thereof. The formation of the flange 5 has no influence on the couplings as such so far as its correct height from the upper edge of the rails is concerned.

The shackle link L is also a unitary structure consisting of a stamping of sheet metal, for example, or a die casting of synthetic thermoplastics material. The link L forms a stirrup, the cross-piece of which is constructed as a shock bar 6, whilst the relatively opposed bent shanks are provided at their ends with eyes 7 for pivotable suspension from the coupling member. All the couplings of the "Fleischmann" system can be coupled by means of the shackle link L which is disposed above the hook 1 of the coupling member K (Fig. 4). On the upper edges of the shanks, the shackle link L has a tongue-like horn 8 of narrow triangular form which serves to couple the couplings of the "Trix" system.

The L-shaped draw hook Z, in the form of a bell-crank lever, also consists of one piece, for example, of a stamping of sheet metal, and has at one (front) end an actual hook 9 extending downwardly at right angles and having an inclined front run-on surface 10

and, at its apex 11 a hole 12 for the passage of the pivot pin S and a downwardly extending operating arm 13 for transmitting the pressure of the uncoupling device, as will be further described hereinafter. Instead of, or additionally to, the operating arm 13, the draw hook can be fitted with an arm which extends behind the pivotal axis and carries at its end a metal mass which is intended to be attracted by a magnetic uncoupling device in order to swing up the draw hook for uncoupling.

Due to the asymmetrical mounting, the draw hook Z is disposed by its specific gravity on the front upper edge of the shock bar 6 of the shackle link L at 14 (Fig. 4). The draw hook Z hangs displaceably between the eyes 7 of the shackle link L and together with the link between the lugs 2 of the coupling member K on the same pivot pin S, whilst a suitable amount of lateral play is taken into consideration for travelling around curves. For receiving the operation arm 13 in its raised position, the hook 1 of the coupling member K as shown in Fig. 1, has a centre recess 1a.

The pivot pin S serves to hold together the individual coupling members K, L and Z and simultaneously provides bearings for the coupling link K, L and the draw hook Z. When the coupling is completely assembled it is disposed horizontally and transversely to the direction of travel. As a pivot pin S a screw or rivet having a counter-head, or any other member fulfilling the same purpose, may be used.

In contrast to previous coupling systems, the shackle link L is not rigid and incapable of adjustment in level, but is secured to the coupling member K in such manner that it can be swung upwardly. In the inoperative position of the shackle link L (i.e. in its uncoupled position) it rests on the shoulders 4 at 15 (Fig. 4) which are present on the coupling member K near the lugs 2 and prevent it falling below the correct height from the upper edge of the rails. The position of rest of the coupling is shown in Figs. 4 and 6. When vehicles are coupled up and uncoupled with a "Marklin" coupling, the space necessary for hooking the "Marklin" ring shackle 16 (Fig. 8a) is obtained by virtue of the displaceable mounting of the shackle link L disposed above it. With the use of vehicles fitted with the "Fleischmann" or "Trix" coupling, the shackle link L receives considerable impact forces as will be seen from Figs. 9b and 10b. However it cannot rotate as a result of these forces since its axis of rotation lies somewhat above the horizontal centre axis 17 (Fig. 4) of the effective impact forces. Due to the impact a downward movement component occurs whereby the shackle link L is urged against the shoulders 4 of the coupling member K in contact with

the lower edge of the link L. The slight inclined position of the front impact bar surface 18 of the shackle link L of 84° relative to the centre axis 17 of the impact forces, increases this downwardly directed movement component. Instead of the shoulders 4 on the coupling member K, the shackle link L may have one or two downwardly extending lugs at its eyelet end which are intended to rest directly on the flange 5 of the coupling member K when the coupling is in the rest position.

Mode of Operation of the Coupling

Coupling is effected in every case merely by pushing the vehicles together; uncoupling is also effected automatically by means of a mechanically actuated or electric remote control uncoupling device such as has been used for years with model railways.

a) With use of two couplings of the type shown in Fig. 6 (Figs. 7a, 7b and 7c).

Coupling (Fig. 7a): When two vehicles, fitted with couplings of the type shown in Fig. 6, are pushed together, the two draw hooks Z, Z' slip over the upper edge of the approaching corresponding shackle link L' due to their inclined front run-on surface 10 (Fig. 3a) and drop into the two shackle links L, L' when the latter collide completely; this produces coupling up (Fig. 7b). The lateral play of the draw hook Z and its rounded front edge ensure that, upon the automatic coupling of two couplings on a straight track length, the two draw hooks Z and Z' slide past each other.

Upon a pulling strain on the coupling, the two engaged draw hooks Z and Z' transmit the traction forces to the inner side of the corresponding shackle link. When the coupling is stressed by impact, the draw hooks Z and Z' remain loosely hooked together and the shackle link of the colliding vehicle transmits the impact forces to the front of the corresponding shackle link.

Uncoupling (Fig. 7c): By pressure from below on the arms 13 (Fig. 3a) and 13' of the draw hooks Z and Z' towards each other by means of an uncoupling device, the hooks Z and Z' are simultaneously raised and disengage from the shackle links L and L', whereupon the two vehicles can be drawn apart. If the vehicles are separated from each other by more than the length of the uncoupling device and thus the pressure from below ceases, the draw hooks Z and Z' drop down on to the upper edge of the shackle link L into the rest position due to their own weight and are ready for coupling up again.

b) With use with a coupling of the "Marklin" system (Figs. 8a, 8b and 8c).

Coupling up (Fig. 8a): When the two vehicles are pushed together, the ring shackle

16 of the "Marklin" coupling slips over the hook 1 (Fig. 1a) of the coupling member K and due to its own weight, drops after rising above the point of the hook, into the latter. This effects coupling up (Fig. 8b). When the coupling is stressed by impact, the ring shackle 16 of the "Marklin" coupling remains loosely engaged whilst the front of the hook 1 of the coupling member K transmits the impact forces to the rigid coupling buffer 19 of the "Marklin" coupling, or conversely.

Uncoupling (Fig. 8c): By pressure from below on the operating arm 20 of the "Marklin" ring shackle 16 (Fig. 8a) by means of an uncoupling device, the ring shackle 16 is raised beyond the level of the hook 1 on the coupling member K, strikes against the lower edge of the shackle link L above it and raises it also, together with the draw hook Z disposed above it.

The "Marklin" ring shackle 16 therefore disengages upwardly; the space necessary for this purpose is provided by the upwardly displaceable mounting of the shackle link L disposed above it. The two carriages can now be drawn apart. If the carriages are separated from each other by more than the length of the uncoupling device and the pressure from below thus ceases, the shackle link L and the draw hook Z above it drop back into the resting position due to their own weight and are ready for recoupling, whilst the "Marklin" ring shackle 16 also drops back into the resting position.

c) In use with a coupling of the "Fleischmann" system (Figs. 9a, 9b and 9c)

Coupling up (Fig. 9a): When the two carriages are pushed together, the draw hook Z of the present coupling and the coupling hook 21 of the "Fleischmann" coupling slip over the upper edge of the mutually approaching shackle links L and L' due to their inclined front run-on surface 10 (Fig. 3a) and, due to their own weight, drop into the links when the links fully collide. This effects coupling (Fig. 9b). When the coupling is stressed by impact, the draw hooks Z and 21 remain loosely engaged; the shackle link of the colliding vehicle transmits the impact forces to the front of the corresponding shackle link.

Uncoupling (Fig. 9c): By pressure from below on the arms 13 of the draw hook (Fig. 3a) and 22 (Fig. 9b) by means of an uncoupling device, the tongues 9 and 23 are simultaneously raised and disengage upwardly from the shackles L and L' whereupon both vehicles can be drawn apart. If the vehicles are separated beyond the length of the uncoupling device and thus the pressure from below ceases, the draw hooks Z and 21 (Fig. 9a) fall back on to the upper edge of the shackles L, L' into the resting position due

to their own weight and are ready for re-coupling.

5 d) In use with a coupling of the "Trix" system (Figs. 10*a*, 10*b* and 10*c*).

10 Coupling up (Fig. 10*a*): When the two vehicles are pushed together, the displaceably mounted wire ring 24 of the "Trix" coupling first slips over the draw hook Z of the present coupling, then over the tongue-like horns 8 (Fig. 2*a*) of the shackle link L and then falls by its own weight at 25 (Fig. 10*b*) on to the upper edge of the draw hook Z. This effects coupling.

15 Upon full collision of coupling link L and "Trix" buffer 26 (Fig. 10*b*), the lower point 9 (Fig. 3*a*) of the draw hook Z easily settles on the upper surface of the "Trix" buffer 26; the travelling properties of both vehicles around curves are not impaired thereby.

20 When the coupling is stressed by impact, the wire ring 24 remains loosely engaged and the shackle L transmits the impact forces to the front of the "Trix" buffer 26 or conversely.

25 Uncoupling (Fig. 10*c*): By pressure from below on the arm 13 of the draw hook and the actuating arm 27 of the "Trix" coupling by means of an uncoupling device, the draw hook Z and the wire ring 24 are raised. The height of the horns 8 of the shackle L is calculated so that the wire ring 24 of the "Trix" coupling is raised beyond its points. It therefore disengages upwardly and slides over the upper edge of the draw hook Z when the vehicles are drawn apart. If they are separated beyond the length of the uncoupling device and, consequently, the pressure from below ceases, the draw hooks Z and the wire rings 24 of the "Trix" coupling fall by their own weight back again into the rest position on to the upper edge of the shackle link of the present coupling, or the "Trix" buffer 26, and are ready for re-coupling.

WHAT WE CLAIM IS:—

1. An automatic coupling for model railways, characterised by a coupling member terminating at one end in an upwardly directed hook and having at the other end means for its attachment to a vehicle, also by a shackle link pivotally journalled in eyes of the coupling member and by a draw hook in the form of a bell-crank lever which is pivotably journalled at its apex, whilst at least one member is provided for the co-axial mounting of the shackle link and draw hook.

2. A coupling as claimed in claim 1, in which the shackle carries on both sides an upwardly extending tongue-like horn.

3. A coupling as claimed in claim 1 or 2, in which members are combined in a pin which is mounted in the eyes of the coupling member and secured against unintentional fall out.

4. A coupling as claimed in any of claims 1 to 3, in which the coupling member has two turned-up lugs which contain the eyes and carry two shoulders which extend at a right angle thereto and serve as supports for the shackle.

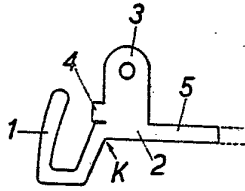
5. A coupling as claimed in any of claims 1 to 4, in which the shackle has at the eyelet end, one or two downwardly extending lugs which are adapted to rest on the coupling member when the coupling is in the rest position.

6. A coupling as claimed in any of claims 1 to 5, in which the draw hook has means which render possible the swivelling thereof for uncoupling by magnetic attraction.

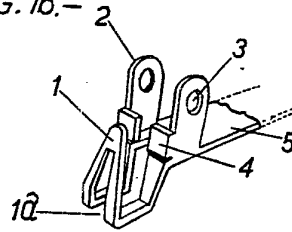
7. An automatic coupling for model railways constructed and arranged to operate substantially as herein described with reference to and as illustrated in the accompanying drawings.

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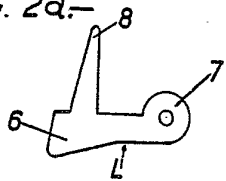
-FIG. 1a.-



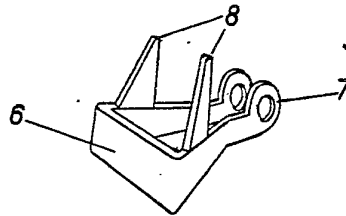
-FIG. 1b.-



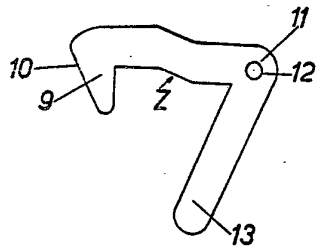
-FIG. 2a.-



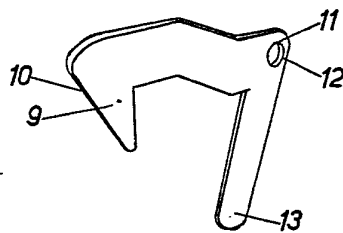
-FIG. 2b.-



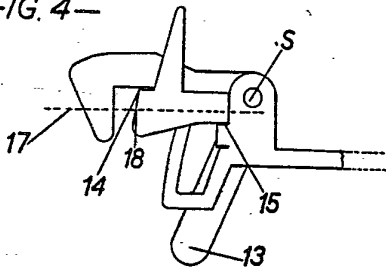
-FIG. 3a.-



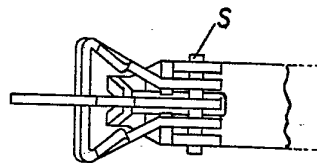
-FIG. 3b.-



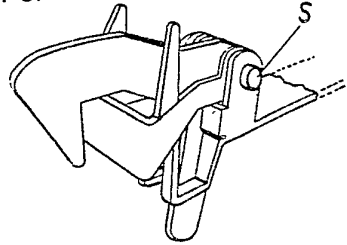
-FIG. 4.-



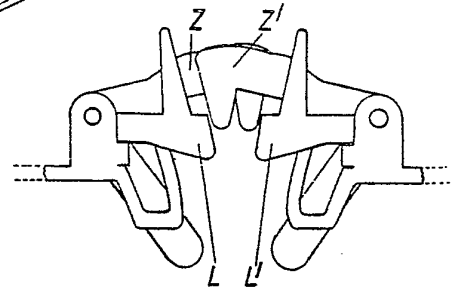
-FIG. 5.-



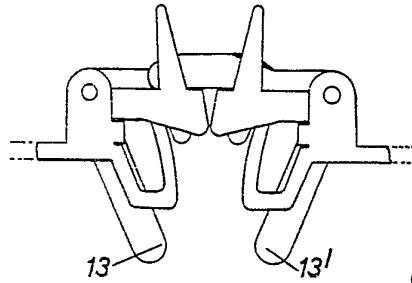
-FIG. 6.-



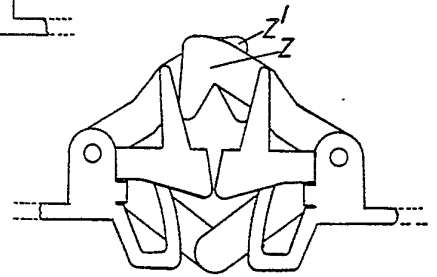
-FIG. 7a.-



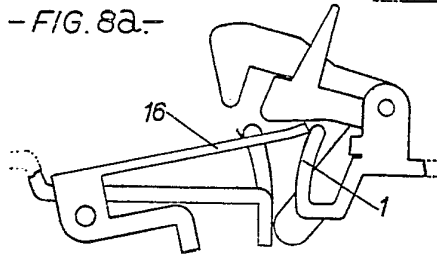
-FIG. 7b-



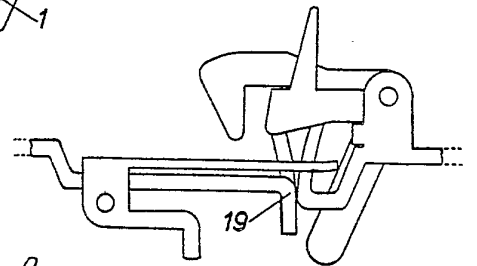
-FIG. 7c-



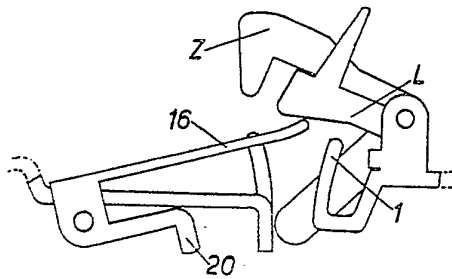
-FIG. 8a.-



-FIG. 8b-



-FIG. 8c.-

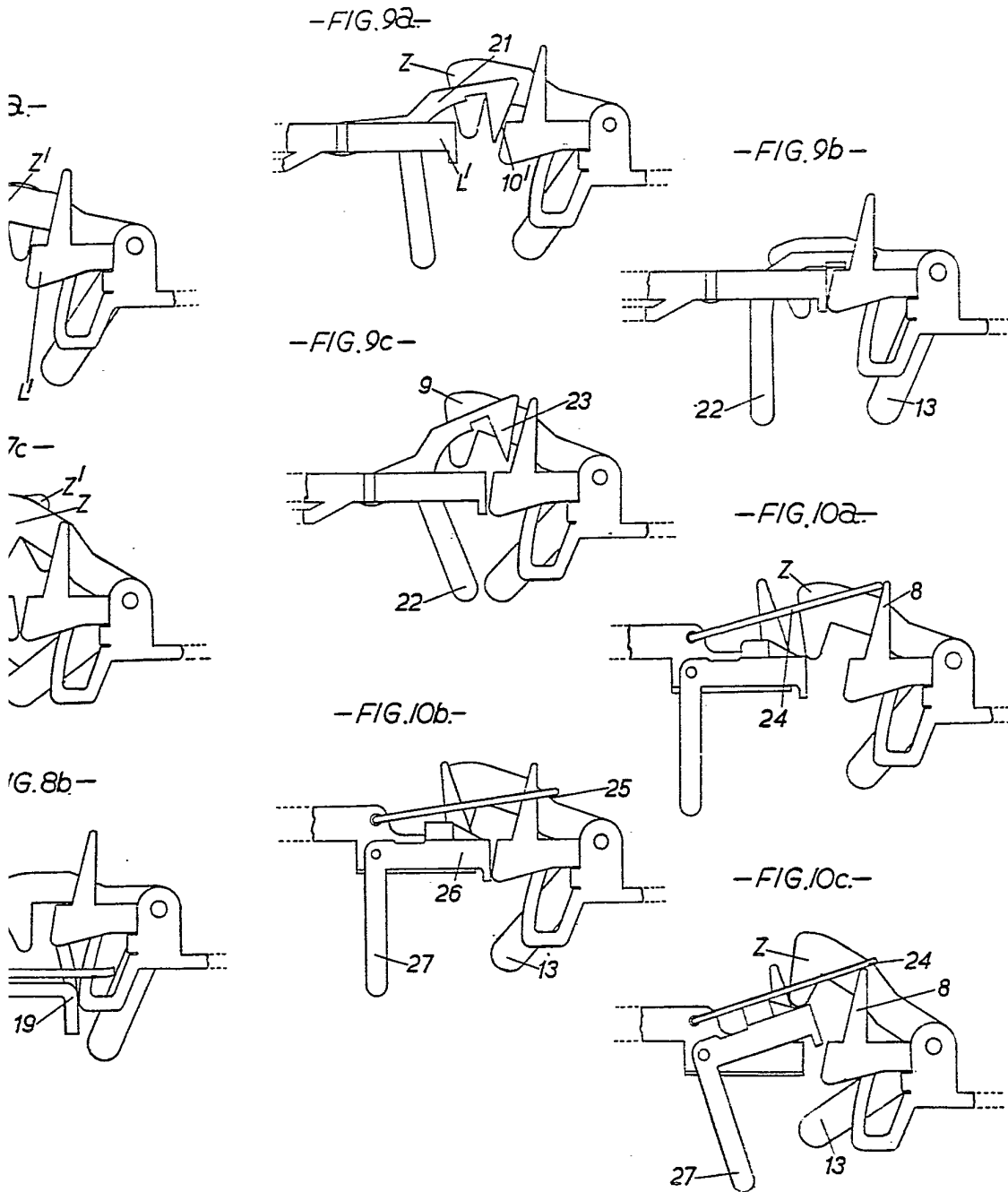


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Sheets 2 & 3



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