

[54] TWO-PART MOTOR VEHICLE DOOR LATCH

3,804,441 4/1974 Kobayashi et al. 292/216

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[57] ABSTRACT

A motor vehicle door latch has an inner plate which is secured to the inner face of the edge panel of the vehicle door and on which is secured the operating mechanism of the latch. An outer housing has a metal plate and a synthetic-resin body spacing the plate from the edge panel with the locking pawl and other mechanism for engaging and holding the bolt on the doorpost. Screws secure the two plates together and pass through the door-edge panel and the synthetic-resin body, acting as pivot axes for the pawl and other rotary mechanism in the outer housing. The body is formed with tubular regions on which the rotary elements such as the locking pawl are pivoted and through which the screws pass as reinforcement.

[30] Foreign Application Priority Data

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[52] U.S. Cl. 292/216; 292/340

[51] Int. Cl. E05c 3/26

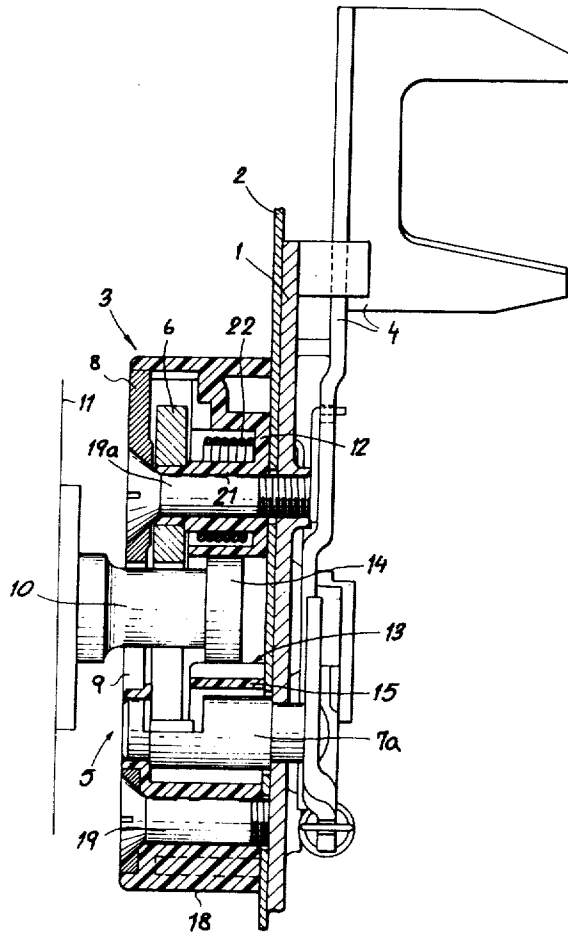
[58] Field of Search 292/198, 216, 280, 340, 292/DIG. 25, DIG. 26

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9 Claims, 12 Drawing Figures



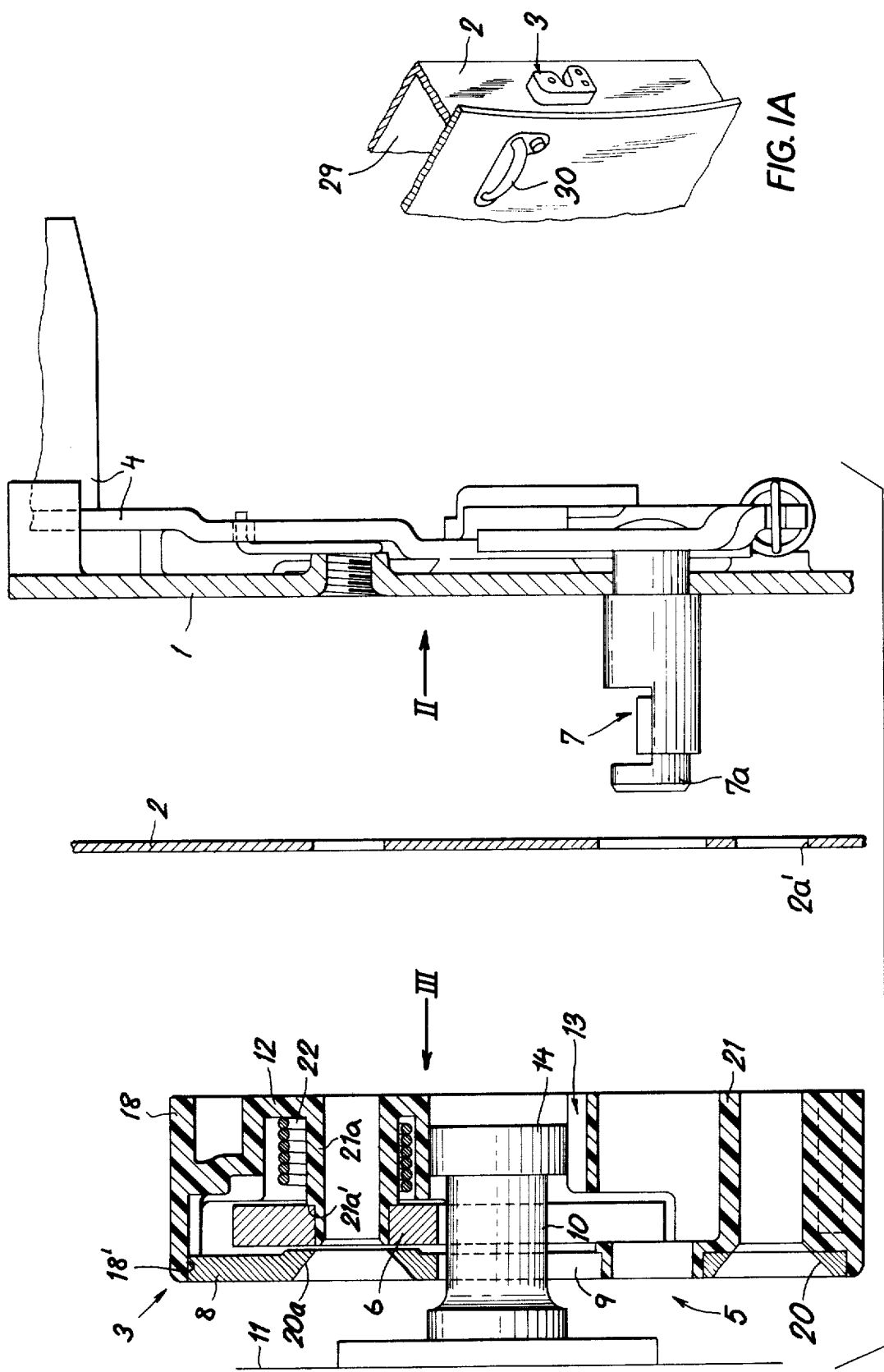
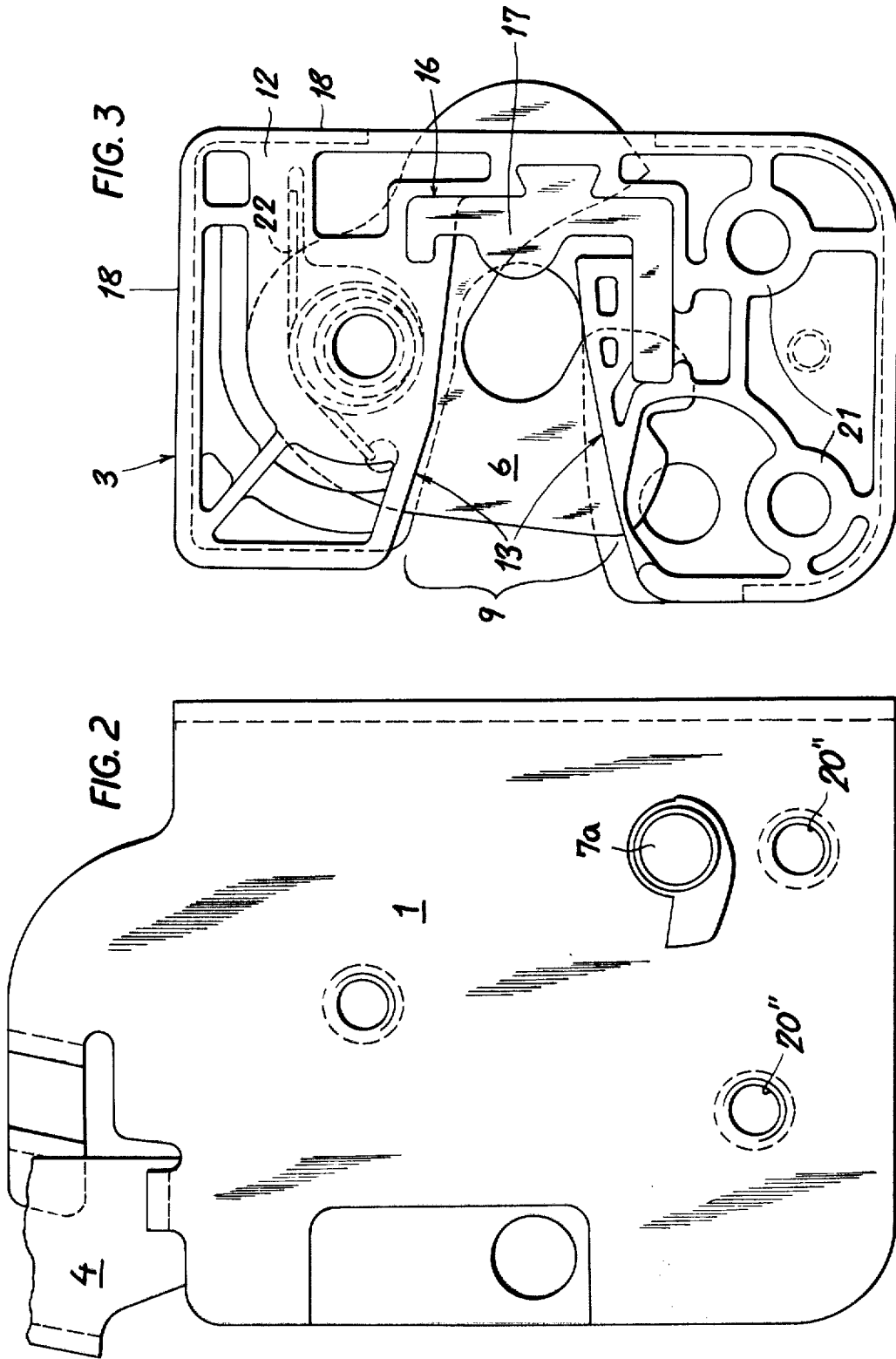
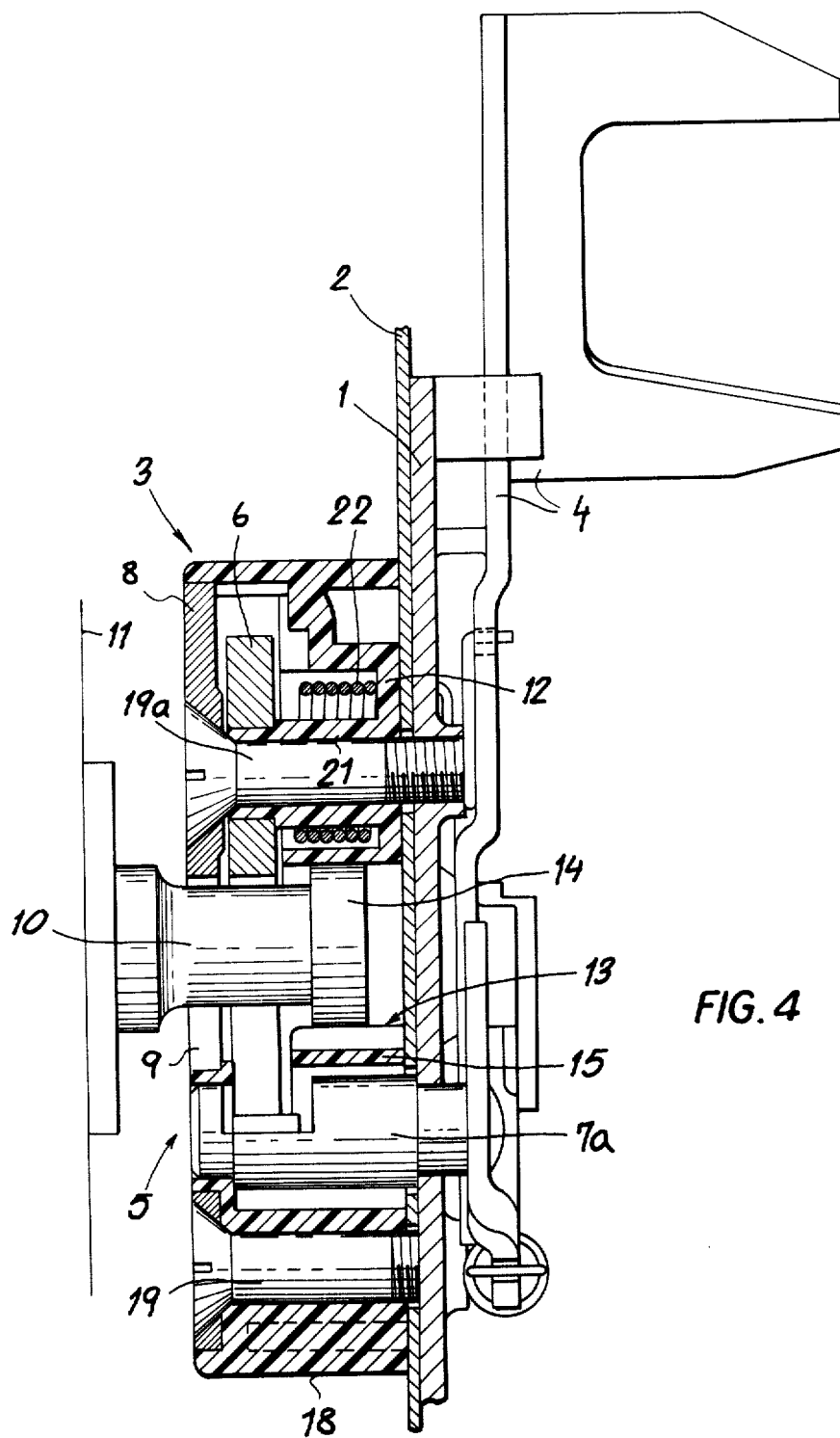
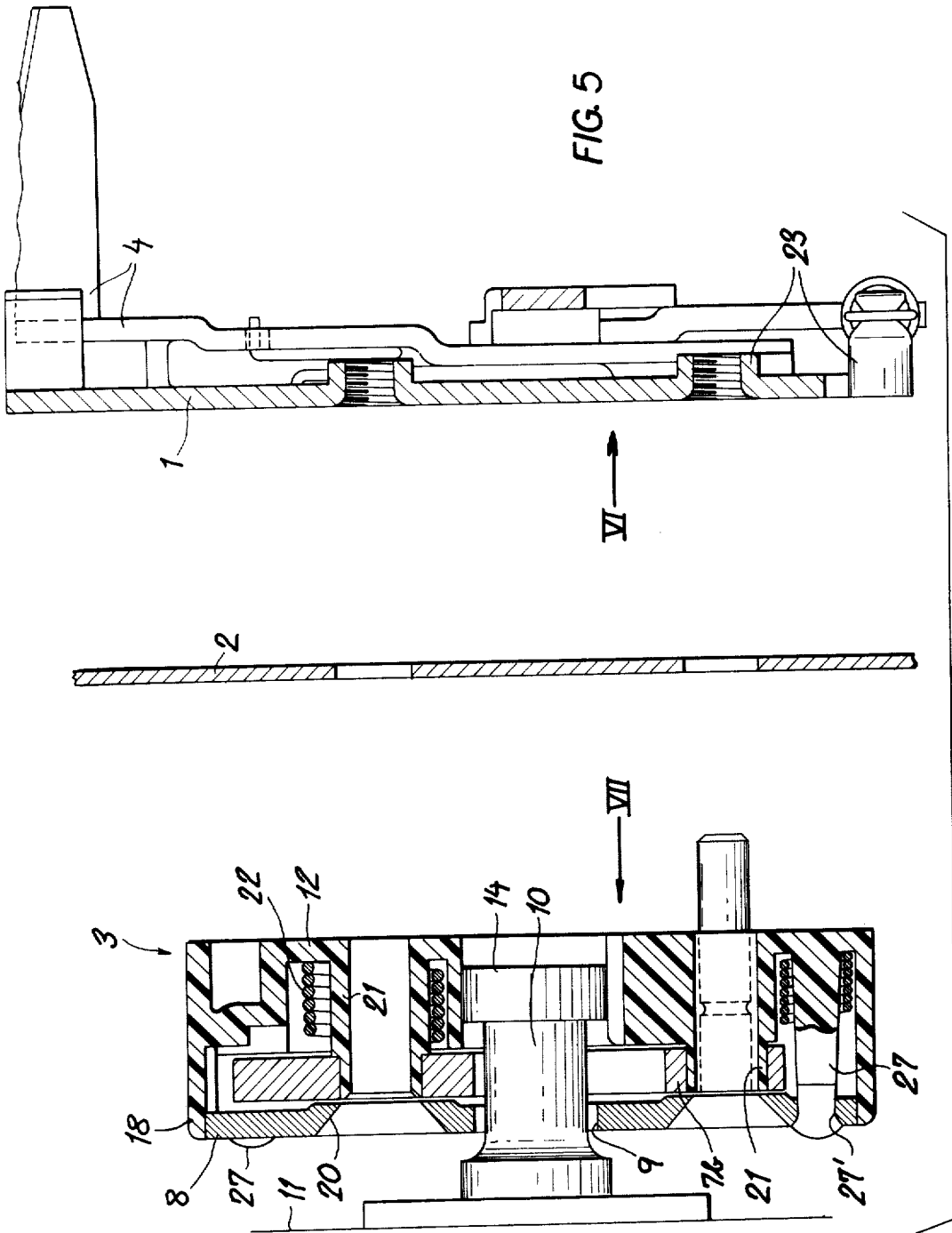


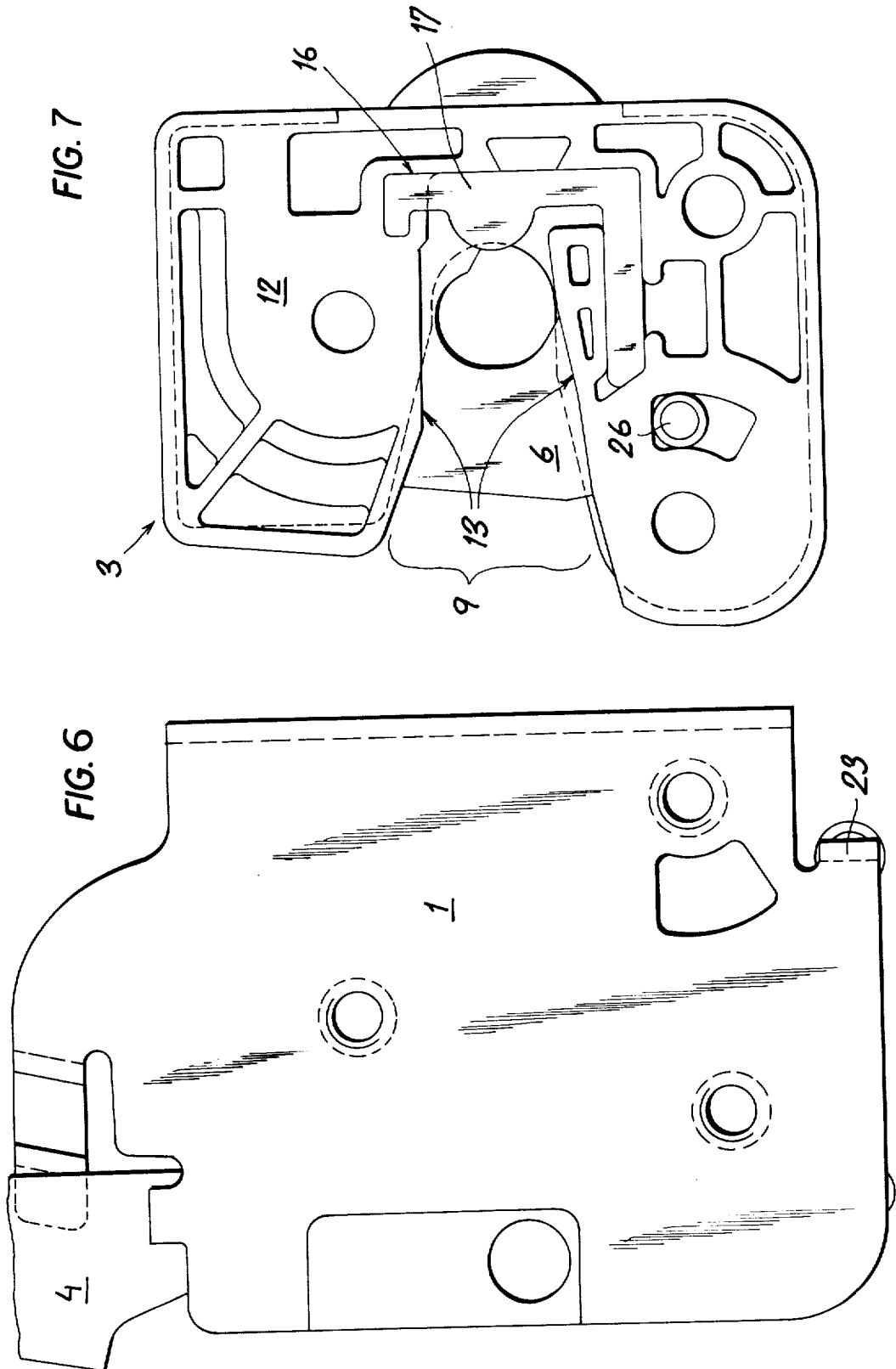
FIG. 1A

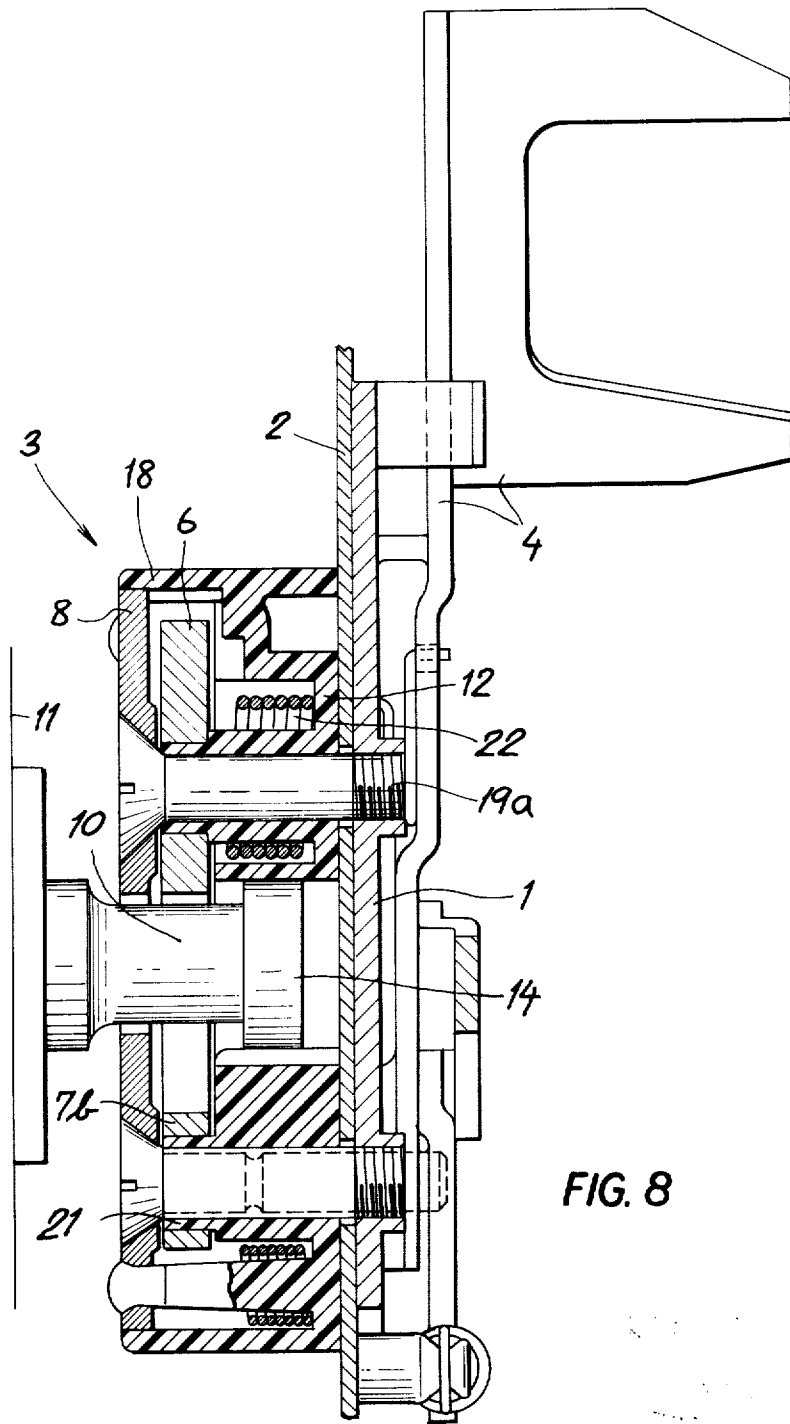
FIG. 1

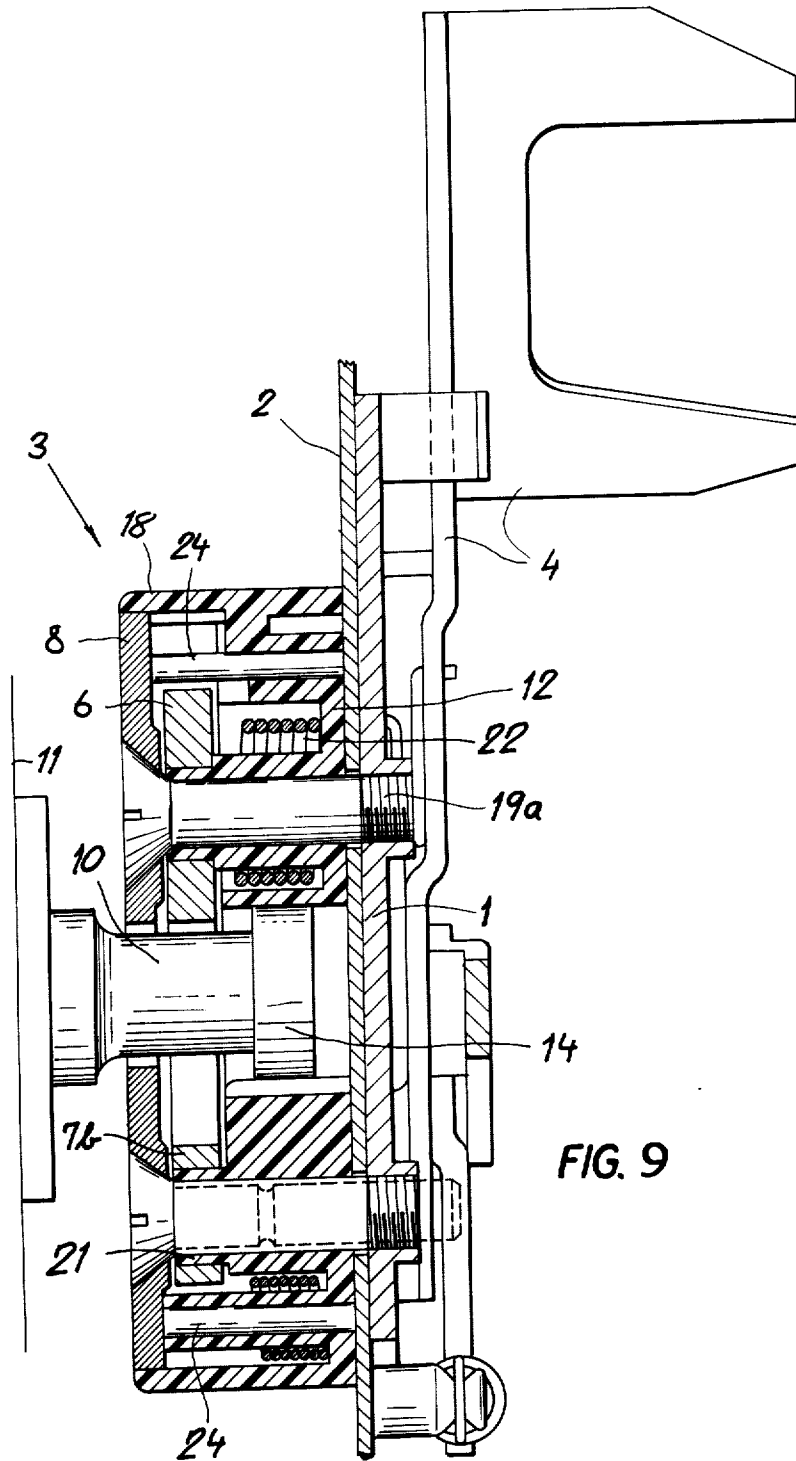


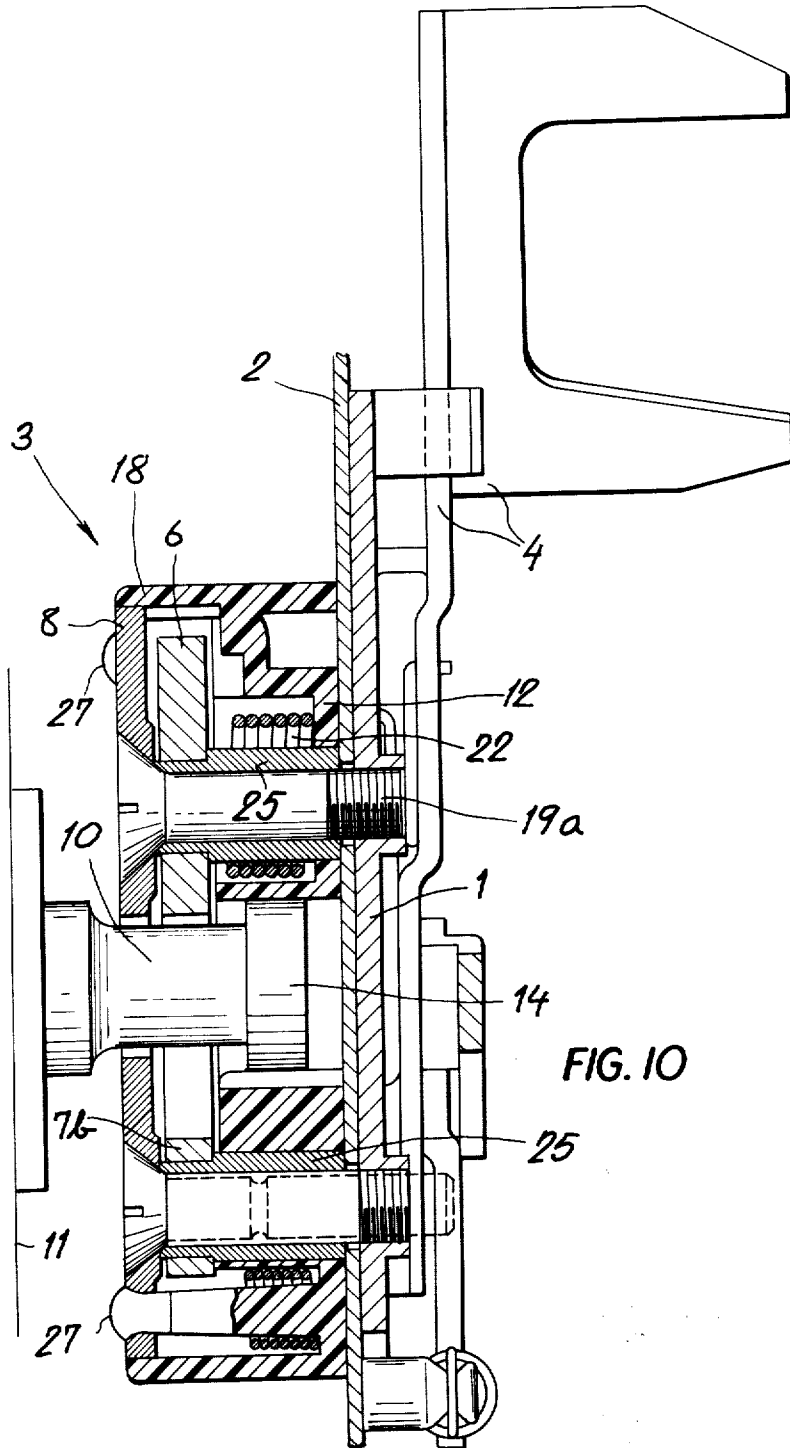


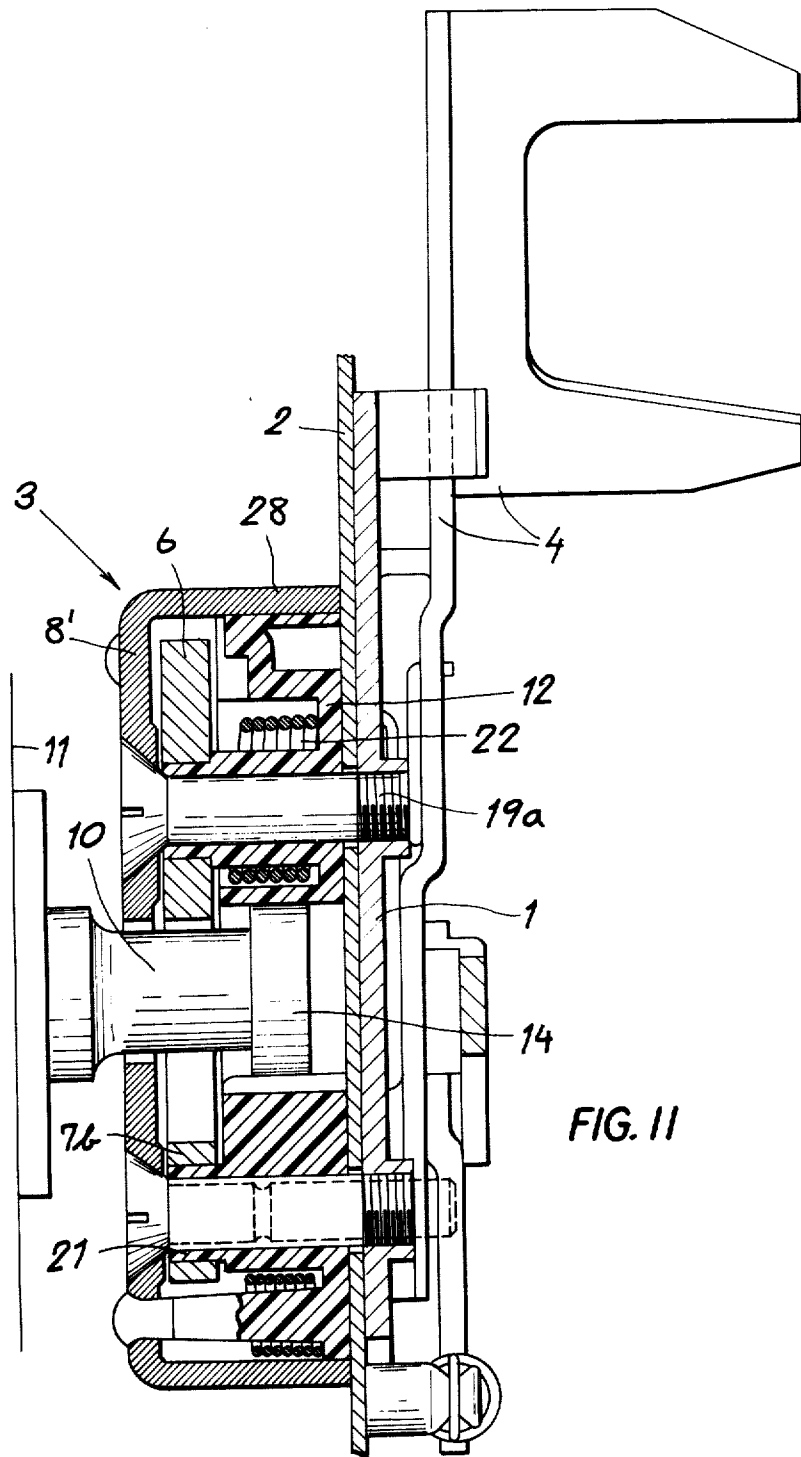












TWO-PART MOTOR VEHICLE DOOR LATCH

1. CROSS-REFERENCE TO RELATED APPLICATIONS

This application is related to my copending applications Ser. Nos. 220,037 (now U.S. Pat. No. 3,781,045) and 338,816 filed on Jan. 24, 1972 and Mar. 7, 1973, respectively.

2. FIELD OF THE INVENTION

The present invention relates to a motor-vehicle door latch and, more particularly, to a latch which is mounted on the edge of a door and which catches and holds a locking bolt or the like mounted on the respective doorpost.

3. BACKGROUND OF THE INVENTION

As a general rule a motor-vehicle door latch has a housing comprising a base plate to which is attached a U-section cover plate formed with a notch in which a latching bolt or pin mounted on the vehicle doorpost is receivable. The housing is mounted on the edge of the door and much of the lock mechanism, in particular the lock fork which catches and holds the latching pin, and the pawl are journaled between the two plates on the outside of the edge panel. The operating mechanism is generally provided within the door, an extension of the latch pawl passing through the base plate being operated by this mechanism.

Both of these plates are fairly expensive to produce. They must be bent to the proper shape, and then all of the various holes and notches must be painstakingly machined in them. In particular the flanks of the U-shaped element must be machined in order to secure the mechanism inside.

In addition the assembly of motor vehicles is generally carried out in such a manner that first the operating mechanism is mounted inside the door, then the latching arrangement must be secured to the door edge. Thus the various tolerances of the metal constituting the door edge are quite important. In addition the assembler must put together the outside mechanism on the spot and fit it to the door. The axles for the latch fork and the latch pawl must be carefully fitted into both sides of the lock housing as the device is assembled, a moderately complicated operation.

4. OBJECTS OF THE INVENTION

It is, therefore, an object of the present invention to provide an improved motor-vehicle door latch.

Another object is the provision of such a latch which is inexpensive to manufacture.

Yet another object is to provide a motor-vehicle door latch which lends itself to the two-stage assembly described above.

5. SUMMARY OF THE INVENTION

These objects are attained according to the present invention in a motor-vehicle door latch having a housing formed of a pair of plates which sandwich a molded synthetic-resin body and the door edge. This body is attached to the outer plate and carries the locking pawl as well as the torsion spring that urges it in one direction. The inside plate carries the operating mechanism and the keeper and is formed with threaded holes so that heavy metal screws can be inserted through the outer plate and the central body as well as through cor-

responding holes in the door edge into the inner plate to secure the assembly together.

According to another feature of this invention the securing screws act as the rotation axis for the locking pawl. To this end the body is formed with a sleeve around which the pawl is journaled on the sleeve. The securing bolt passes through the sleeve and reinforces it.

In accordance with another feature of this invention the body is either bonded to the outer plate so as to be securely attached thereto or it is provided with clips that engage the outer plate and hold the latching assembly together.

Such an arrangement is inexpensive to manufacture in that the complicated internal body is made simply of synthetic resin which can be molded inexpensively. The cover plate need merely be drilled and cut out. In addition assembly of the latch is quite simple since the outer assembly including the outer plate, the synthetic-resin body, the locking pawl, the torsion spring for this pawl, and whatever other parts are included on the outside part of the latch housing are all held securely together. The fitting of a few heavy machine screws mounts the entire latch extremely solidly.

Another advantage of such a structure is that it makes the latch operate extremely silently. Journaling the pawl and the keeper in synthetic-resin tubes eliminates much potential squeaking, and in general cuts down noise generated by the lock.

6. DESCRIPTION OF THE DRAWING

The above and other objects, features, and advantages of the invention will become more readily apparent from the following description, reference being made to the accompanying drawing in which:

FIG. 1 is an exploded sectional view of a latch according to this invention;

FIG. 1A is a perspective view of a vehicle door carrying the latch of FIG. 1;

FIGS. 2 and 3 are views taken in the direction of arrows II and III of FIG. 1, respectively;

FIG. 4 is a section similar to FIG. 1 showing that latch in assembled condition;

FIGS. 5 - 8 are views similar to FIGS. 1 - 4, respectively, showing another arrangement according to the present invention; and

FIGS. 9 - 11 are views similar to FIGS. 4 and 8 showing further configurations of the latch of this invention.

7. SPECIFIC DESCRIPTION

As shown in FIGS. 1 - 4 a motor-vehicle door latch has a housing formed of an inside plate 1 adapted to lie on the inside of a panel 2 constituting the edge of the vehicle door 29 (FIG. 1A) and an outer housing 3. Operating mechanism generally indicated at 4 and connected to the door handle 30 is secured to the plate 1 and connected through the plates 1 and 2 to latching mechanism 5 within the outer housing 3. The mechanism 5 comprises a pivotal locking pawl or fork 6 and the mechanism 3 has a keeper 7 which is engageable with this pawl 6 to lock it in position as described in the above-cited patent applications.

The outer housing 3 comprises a flat steel plate 8 formed with a notch 9 in which the bolt 10 secured to a vehicle doorpost 11 is receivable, and a synthetic-resin body 12, here phenol-formaldehyde, which is formed with two bumpers 13 lying along the inside

edges of the notch 9 as described in my earlier patents and patent applications. The head 14 of the bolt 10 bumps against these cushions 13 and an extension 15 of one of the cushions serves to prevent manipulation of the keeper 7 from outside the latch. In addition the body is formed with a cutout 16 accommodating a back cushion 17 that lies at the bight of the notch 9 and is of softer synthetic-resin material, a polyethylene for example, to take up the shock as the door is shut.

The body 12 forms a peripheral wall 18 which surrounds the housing on all sides but the opening of the notch 9 and therefore keeps water and dirt out of the interior of the latching mechanism 5. The body 12 is formed below the notch 9 with a pair of sleeves 21 which align with holes 20 in the plate, with holes 20' in the plate 2, and with threaded holes 20'' in the plate 1, so that flush machine screws 19 may secure all these elements together. The sleeves constitute a rigid spacer between the plate 8 and the plate 2. Above the notch 9 the body 12 is formed with another sleeve 21a forming a hole that aligns with a hole 20a in the plate 8 and with holes 20a' and 20a'' in the plates 2 and 1, respectively, the latter being threaded so that a flush machine screw 19a again may secure these elements together. The sleeve 21a also constitutes a support both for the pawl 6 and its torsion spring 22 which has one end secured in the pawl 6 and its other end in the body 12. The sleeve 21a is stepped at 21a' so that the pawl 6 lies adjacent the plate 8. In this manner the screw 19a reinforces the sleeve 21a and provides a very firm mounting for the pawl 6. The body 12 is also formed with a short sleeve 21b that fits into the plate 8 and acts as a journal for the outer end 7a of the keeper 7.

The body 12 is cemented to the plate 8 at 18' so that the entire outside-housing assembly shown to the left in FIG. 1 forms a single assembly that can just be placed against the door panel 2 and then secured in place by screws 19 and 19a.

The configuration shown in FIGS. 5 - 8 has a keeper 7b which is pivotal within the housing 3 about one of the sleeves 21 through which the screws 19 extend. This keeper 7b is provided with an operating pin 26 which extends through in-line apertures in the plates 1 and 2 into the mechanism 4 so that this mechanism can operate the keeper 7b. In addition the body 12 is formed with a projection 27 engageable through a hole 27' in the plate 8 to hold these two elements together. Clips 27 are also provided to the other side of the notch so that the unit is held firmly together, but the body 12 can be separated from the plate 8 if desired, since the head of each projection 27 is only slightly larger than the respective hole 27'. The plate 1 can be partially or wholly formed of synthetic-resin material, and is formed with journals and guides 23 for the various elements of the mechanism 4.

In FIG. 9 the arrangement is formed much as in FIGS. 5 - 8, but short steel spacer pins 24 are provided which each have one end bearing on the plate 2 and another end on the plate 8, so as to maintain a fixed distance between these two elements. Such spacer pins 24 insure that the bolts 19 and 19a will not loosen on shrinking of the body 12.

The configuration of FIG. 10 uses steel sleeves 25 which take the place of the sleeves 21 and 21a of FIGS. 1 - 9. These sleeves act as spacers, much as the pins 24, and as journals for the pawl 6 and keeper 7b.

In FIG. 11 the plate 8' is generally U-shaped with two parallel legs 28 above and below the notch 9 that rest directly on the door edge 2. In this embodiment the body 12 only forms the vertical edges of the housing half 3 to form an extremely heavy-duty structure.

The latch according to the present invention is inexpensive to manufacture since many of the costly machining operations hitherto necessary are obviated by use of a housing partially formed of an inexpensively molded synthetic-resin body. Such a housing is, however, as rigid and strong as the all-metal housings. The assembly of such a latch on a vehicle door is fairly simple as all of the latching mechanism is held within the outer housing half, so that the assembler need merely screw it in place on the door edge.

I claim:

1. A motor-vehicle door latch for use on the vehicle door-edge panel, said latch comprising:

an outer housing lying against the outside face of said door-edge panel and including

an outer metal plate spaced from said panel and formed with a laterally open notch for receiving a latching bolt and with a plurality of holes, and a synthetic-resin body attached to said plate between same and said panel;

latching means including mechanism mounted solely on said outer housing and including a latch pawl pivotal thereon for engaging and holding said bolt; an inner housing lying against the inner face of said door-edge panel and including an inner metal plate lying against said panel and formed with a plurality of holes alignable with said holes of said outer metal plate;

operating means including mechanism mounted solely on said inner housing and operatively connected to said pawl for blocking rotation thereof and for freeing same for rotation; and

a plurality of screws extending through said holes, said body, and said door-edge panel and each having one end engaging one of said plates and another end engaging the other plate, said body being also formed with a notch corresponding to and underlying the notch of said outer plate and provided at its bight with a cushion for said bolt.

2. The latch defined in claim 1 wherein said latching means includes a tubular pivot in said body for said pawl, one of said screws extending axially through said tubular pivot.

3. The latch defined in claim 2 wherein said body is formed with a sleeve constituting said tubular pivot.

4. The latch defined in claim 2 wherein said tubular pivot is a metal tube having one end bearing against said outer plate and another end bearing against said door-edge panel.

5. The latch defined in claim 3 wherein said latching means includes a pivotal keeper engageable with said pawl and operatively connected to said operating mechanism and another such sleeve formed on said body and constituting a tubular pivot for said keeper, another of said screws extending axially through said other tubular pivot.

6. The latch defined in claim 1 wherein said outer metal plate is flat and said outer housing has a peripheral wall extending between said outer plate and said edge panel and formed by said body.

7. The latch defined in claim 2, further comprising at least one metallic spacer having one end bearing

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against said edge panel and another end bearing against said outer plate.

8. The latch defined in claim 1 wherein said outer plate is U-shaped and has a pair of U-legs standing on said edge panel.

9. The latch defined in claim 1 wherein said body is

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formed with at least one clip and said outer plate is formed with an aperture, said clip extending through said aperture and securing said outer plate and said body together.

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