MODEL OF THE MONTH

SPANNER'S CHOICE FOR ADVANCED BUILDERS

MODERN factories are equipped with many ingenious devices, specially designed for moving goods of all kinds not only from one department to another on the same floor, but also from one floor to another. One of the most modern and useful of these devices is The VertiVeyor, which is made by J. Collins and Sons Ltd., London. This is a machine for providing a rapid compact and labour-saving means of conveying goods vertically, from floor to floor, and a single VertiVeyor can serve a factory having several floors, one above the other. A feature of this appliance is that it is designed to take on its load of goods automatically and also to discharge them automatically at prearranged points. As it operates vertically through the building,

A Meccano VertiVeyor

The VertiVeyor occupies a minimum of valuable floor space and its continuous automatic action avoids interruption in production.

The VertiVeyor makes a really excellent subject for a Meccano model of the advanced type and one that is "off the beaten track" of ordinary model-building. Its various features can be reproduced in a variety of ways and with a variety of Meccano parts so that the construction of a model of The VertiVeyor offers ample scope to advanced model-builders. Some readers may remember that a year or two ago we organised a competition for models of The VertiVeyor, and we have chosen as the subject for our *Model of the Month*, one of the prize-winning models in that Contest. A complete set of illustrations of this model is shown on this and the facing page and a glance at the pictures will reveal many attractive model-building characteristics. The model can be driven by either an E15R or an E20R Electric Motor and is most realistic when in operation. As usual with these *Model of the Month* subjects, readers who wish to build The VertiVeyor can obtain full constructional details and a list of the Meccano parts required to build it simply by writing to the Editor enclosing a 3d. stamp to cover the cost of postage. Readers living in Canada, Australia, New Zealand, South Africa, Rhodesia, Ceylon, United States of America and Italy, can obtain the instructions by writing to our main agents for those countries, also, of course, enclosing appropriate stamps for postage.

We must strongly advise readers who wish to build this model to apply for the instructions as soon as possible because there is bound to be a big demand for the instruction sheets and we cannot guarantee to supply them after the end of the month in which the model is illustrated in the Magazine. So to avoid disappointment, please write for your copy as soon as you receive this issue!

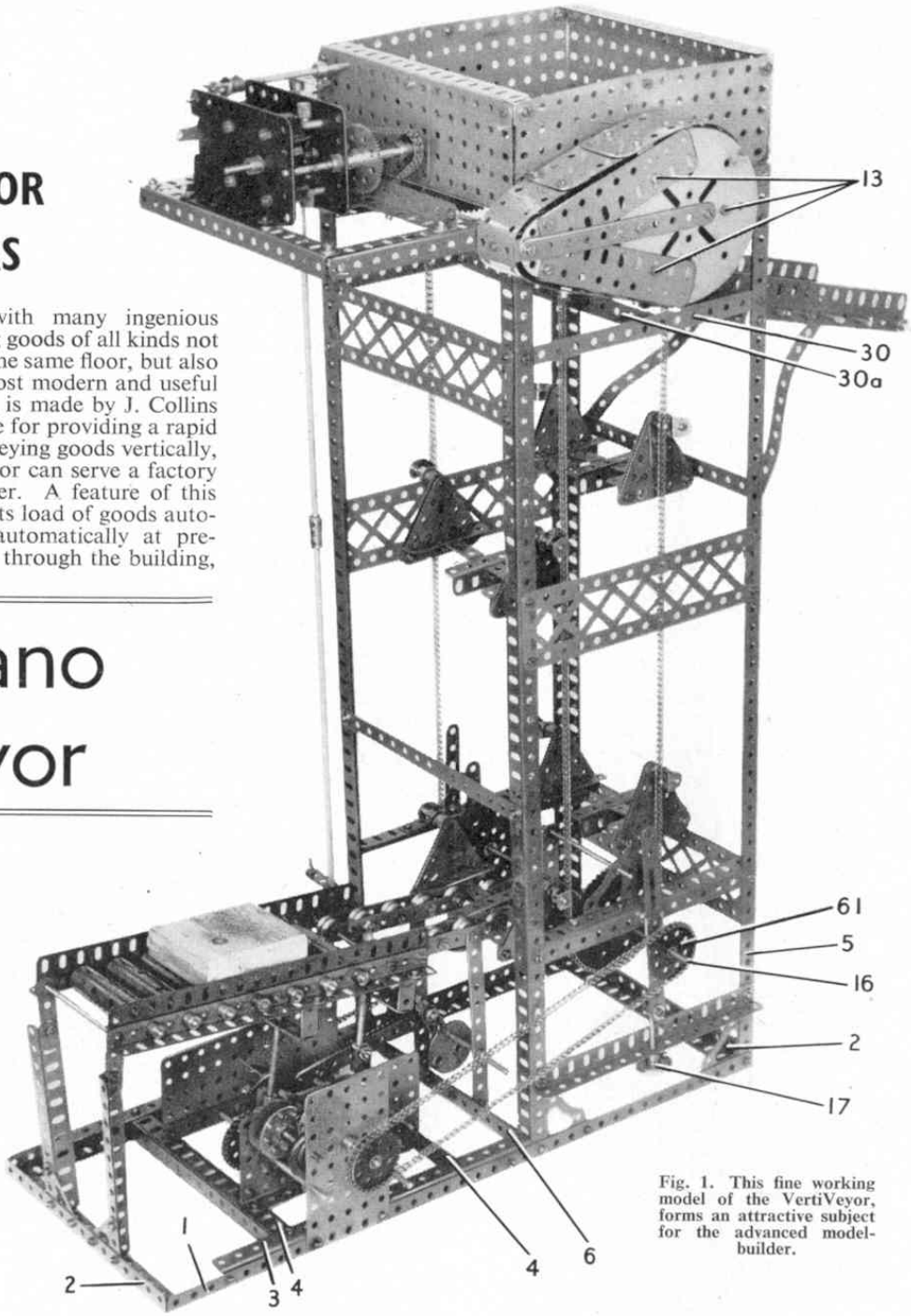


Fig. 1. This fine working model of the VertiVeyor, forms an attractive subject for the advanced model-builder.

Details of the VertiVeyor

The main structure or framework of The VertiVeyor is constructed from steel sections, braced and gussetted to form a rigid support for the driving motor and its gear, which are mounted at the top of the framework. The motor drives the main drive sprockets, and these carry, one on each side of the frame, steel elevating chains, to which are attached the load carriers.

Fig. 2. The feed-in section of the model VertiVeyor and the drive to the feed interrupter mechanism.

The chains pass around two further similar sprockets at the bottom of the frame, and these are mounted on a common shaft that can slide vertically in slots in a bearing block so that the tension in the chains can be adjusted by forcing the sprocket shaft downwards, by means of two screwed rods. Between the two elevating chains hang the load carrier trays, the chains running in vertical guides so as to prevent sway and allow correct pick-up and set-down loads.

The goods to be elevated approach the feed-in section of The VertiVeyor on a gravity roller track and as they near the feed-in point they are arrested by a stop which rises up between the rollers. This is attached to a pivoted rocker arm loaded at one end with a strong spring, and at the inner end of which is another stop known as an intermediate stop. When the apparatus is in motion the rocker arm rocks up and down and when the back stop

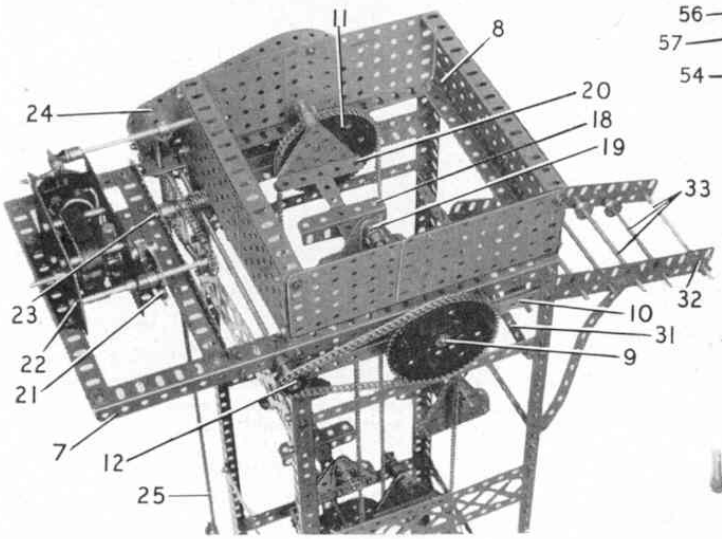
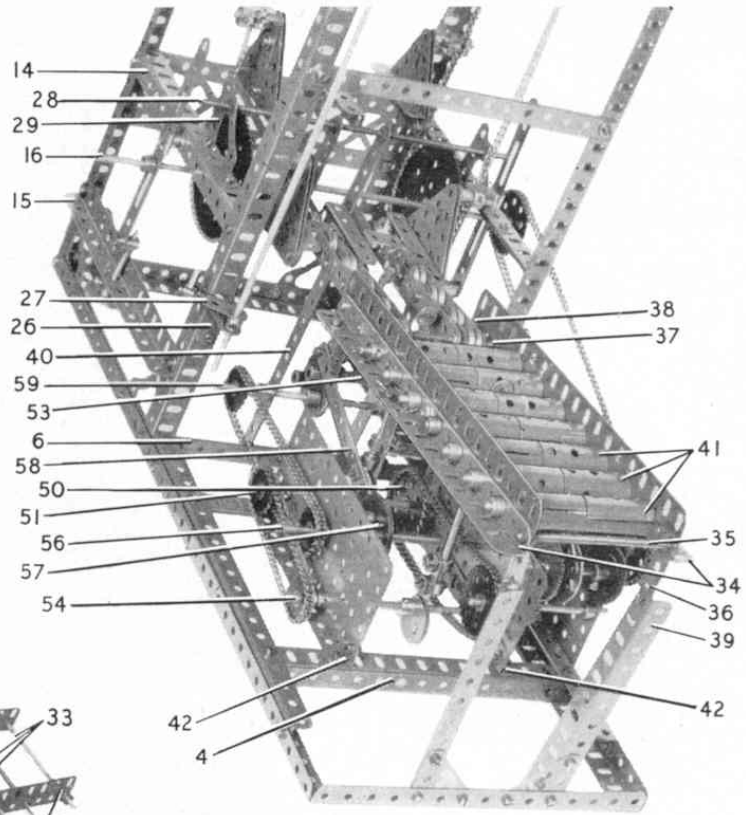


Fig. 3. The upper end of the conveyor framework showing the discharge point or feed-out grid, and the location of the driving motor.

lowers, the intermediate stop rises and allows the goods to advance. As the intermediate stop lowers in its turn, the back stop rises and again holds up the line of goods, with the exception of the first item, which now advances to a further front stop.

As soon as the carriers of The VertiVeyor are clear of the feed-in section, the front stop drops and a pusher comes into action and pushes the load on to the feeding grid of The VertiVeyor. The load remains in the centre of this grid until such time as the next carrier comes up through the grid, when it is taken upward. Having been picked up the loads are carried upward on the carriers and pass over the main upper chain sprockets. Continuing they then proceed in a downward direction until they meet the feed-out grid on the upper floor and leave the load behind. It is usual to link the feed-out grid to some form of power or gravity conveyor, which carries the discharged loads to the required point.



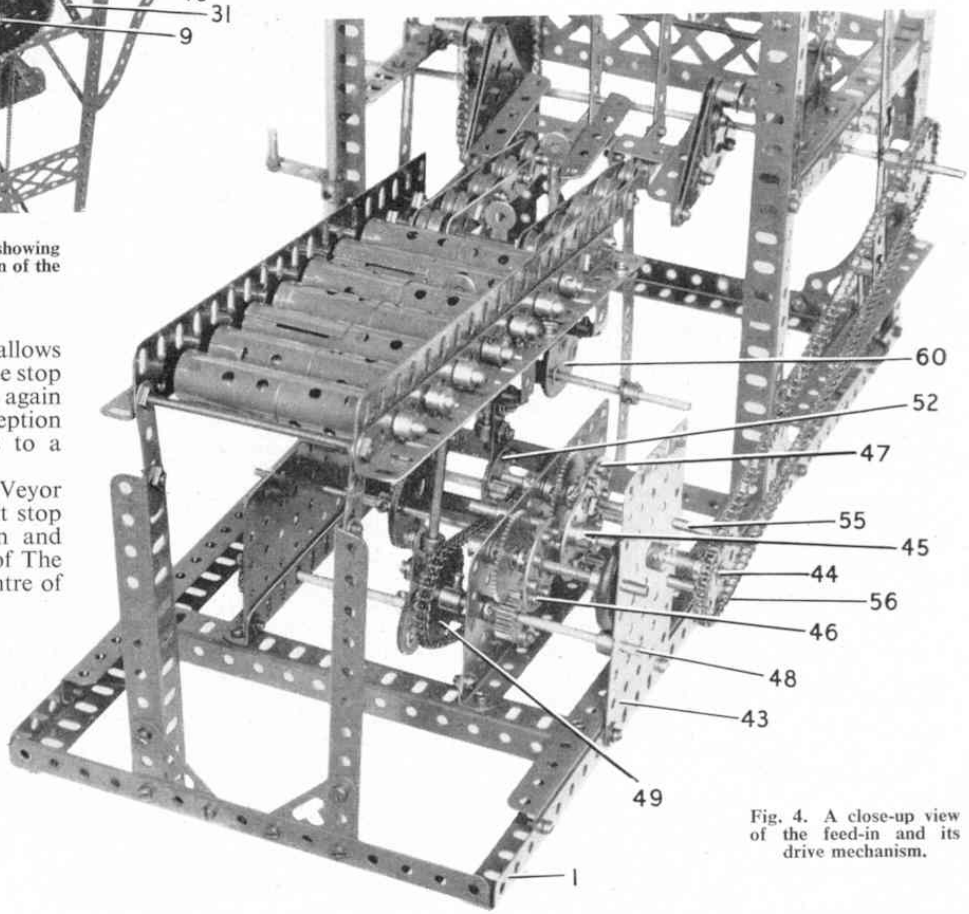


Fig. 4. A close-up view of the feed-in and its drive mechanism.

MODEL OF THE MONTH

Meccano Model VertiVeyor.

Illustrated in the January, 1961, issue of the Meccano Magazine.

Framework.

A rectangular base is built with two 18½" Angle Girders 1, and two 7½" Angle Girders 2. Two 7½" Angle Girders 3 are bolted to the 18½" Angle Girders 1 and supported with 7½" Angle Girders 4. Four vertical 24½" Angle Girders 5 are attached to the base with Corner Gussets. A 7½" Angle Girder 6 is secured to the bottom of two of the vertical Girders 5. At the top of the Angle Girders 5, bolt two 12½" and two 7½" Angle Girders 7 and 8. Strengthen the upright Angle Girders 5 with 7½" Angle Girders, 7½" Strips, and 7½" Braced Girders as shown.

The bearings for the Rods 9, one on each side of the model, are made by bolting two Double Bent Strips to the inner and outer sides of the 12½" Angle Girders 7, and the inner side of the 7½" Angle Girder 10. A 1½" Strip placed on each of the Rods 9, is bolted to the lower Double Bent Strip. Three Washers are placed on the Rod before securing to it the 3" Sprocket Wheel 11. Another 3" Sprocket Wheel and a Collar are placed on the outside of the Rod 9.

The compound 10" Rod 12 carries a ¾" Pinion and two ¾" Sprocket Wheels, which are connected by Chain to the 3" Sprocket Wheels. Eight 4½" x 2½" Flat Plates, forming a 7½" square are fastened to the Angle Girders 8.

The chain-guards are made by bolting a 5½" Strip, and two 4½" Flat Girders to a 4" Circular Plate and a Wheel Disc. The Wheel Disc has a 1½" x ½" Double Angle Strip attached, whilst the Bolts 13 have a 1" x ½" Angle Bracket on the inside. To these Angle Brackets and Double Angle Strip, three 5½" x 1½" and two 2½" x 1½" Flexible Plates are fixed. The guard is fixed to the 12½" Angle Girder by the Double Angle Strip and an Angle Bracket.

On the Angle Girders 14, a Slide Piece is secured with a ⅜" Bolt. A 5½" Slotted Strip is placed in the Slide Piece, the lower end being attached to a Threaded Boss, which is moved by a 2" Threaded Rod mounted in the 7½" Angle Girder 15 and operated by a 1" Pulley Wheel. Two 3" Sprocket Wheels are secured to the 11½" Rod 16.

Endless Chain and Carriers

Two lengths of Sprocket Chain, preferably previously unused, each consisting of 560 links, have Double Brackets attached to them with bifucated paper clips, the Brackets being spread apart every 112 links. (i.e. 111 empty links and then a Bracket.)

The Chains are placed over the top and bottom 3" Sprocket Wheels and held taut by the screwed adjusters 17.

Now build five carriers as follows. A 2½" Angle Girder 18 (Fig. 3) has a Double Bracket and a 1½" x ½" Double Angle Strip bolted to its centre hole, and another 1½" x ½" Double Angle Strip is bolted to the Double Bracket. A 2½" Triangular Plate has a Crank 19 attached, and this holds a 1" Rod. The Plate is bolted to the 2½" Angle Girder 20 with another 2½" Triangular Plate, spaced away with two 2½" Strips between the Plates, so that no bolt shanks protrude on the inside of the carrier. The carriers are fastened to the Chain by placing the 1" Rods through the Double Brackets with a Collar between its lugs. The 3" Sprocket Wheels are set so that the carriers are level.

The Drive

An E15R or E20R Electric Motor is attached to the 7½" Angle Girder and a 3" x 1½" Flat Plate bolted to the 7½" Angle Girder. A ½" Pinion on the Motor armature shaft, drives a 57-tooth Gear Wheel 21 on Rod 22. A ¾" Sprocket Wheel also on this Rod drives a 2" Sprocket Wheel on a 2" Rod 23, which carries a Worm Wheel that engages with a ¾" Pinion on the Rod 12. A Threaded Pin, attached to the starting lever, holds a 3½" Rod with an End Bearing, and is connected to the Crank 24 by a Collar. Two 11½" Rods 25, joined by a Coupling are placed in the Angle Girder 7 and a 1" x 1" Angle Bracket 26. The Cranks 24 and 27 are fastened in position to start or stop the motor. An 8" Threaded Rod 28 held by nuts in the Flanged Brackets 29 has two 2½" Strips, also held by nuts. A 1½" Strip carrying a ½" loose Pulley on a ½" Bolt is bolted to the bottom of each 2½" Strip. This is part of the loading platform, and must clear the 2½" Angle Girders of the carriers. Bolt a 7½" Strip 30a with Angle Brackets to the 7½" Strip 30. Two Bent Strips with ½" loose Pulleys on lock-nutted ½" Bolts, are fastened to the Strip 30a so as to pass between the 2½" Angle Girders in the carriers.

A 7½" Strip 31 is attached to the vertical Angle Girders 5 with Angle Brackets. Two 7½" Flat Girders 32 are attached to Strip 31 by Angle Brackets and support the Rods 33, which have ½" Pulleys or Collars to hold them in position. Two 5½" Strips slightly bent are used to support the Flat Girder 32. The Bent Strips are adjusted to be the same angle as the feed-off platform. Between the Bent Strips is bolted a Flat Trunnion. To the inside of the Strip 31, two Bent Strips with ½" loose Pulleys on ½" Bolts, are placed to face the Bent Strips on the Strip 30a.

Feed-in Platform

Two 9½" Angle Girders 34 have 9½" Flat Girders bolted to them and held apart with a 3½" Screwed Rod 35, which also holds the 2" Slotted Strips 36. A 3½" Screwed Rod 37, besides holding the Angle Girders 34 apart, has two pairs of 4½" Strips 38 fastened to it with a nut on each side of each Strip. Two ½" loose Pulley Wheels are mounted between each pair of Strips. In the next hole of the Strips, a 1⅛" Bolt with ½" loose Pulleys and nuts is bolted to the Angle Girders 34 and the Strips 38. The next two pairs of ½" loose Pulleys are mounted on ¾" Bolts, with nuts and a Washer, and the last roller is a single loose Pulley on a ⅜" Bolt, the Strips 38 being bent slightly inwards.

The feed-in roller conveyor is attached to the model by two 5½" Angle Girders 39 and two 5½" Strips 40. The Strips are secured to a 2½" x ½" Double Angle Strip bolted to the Angle Girder 6. The rollers 41 each consist of two Sleeve Pieces joined together by a Chimney Adaptor, with a further Chimney Adaptor at each end. They are mounted on 3½" Rods.

The Stop Rod and Pusher.

To the Angle Girders 4 two 5½" Angle Girders 42 are bolted, each supporting a 5½" x 2½" Flat Plate. A 4" Rod 44 carries a Bush Wheel 45 that has four Set-Screws in adjacent holes, these mesh intermittently with Bush Wheels 46 and 47, each having eight Set-Screws and nuts in their holes. The Bush Wheel 46 is mounted on a 2½" Rod that carries a 50-tooth Gear Wheel and a 1" Pulley fitted with Rubber Ring, which presses against the Flat Plate 43. A ¾" Pinion on 3½" Rod 48 engages with the 50-tooth Gear Wheel and so drives a 1½" Sprocket Wheel 49 which in turn drives a 1½" Sprocket Wheel 50 on a 5" Rod 51. A Single Throw Eccentric 52 has a 3½" Rod attached to its arm by means of two Collars each of which is fixed to the arm by a bolt fitted with three Washers as shown. The Rod is passed through a 3½" Strip 53 fastened to the Angle Girders 34 by 1" Reversed Angle Bracket. On the upper end of the Rod, a Rod and Strip Connector is placed. A 5" Rod 54, driven by Sprocket Wheel and Chain from Rod 51 carries a similar Eccentric fitted to a 4" Rod that also has a Rod and Strip Connector attached to its upper end. The two Eccentrics are set so that one is in its highest position when the other is in its lowest position. The Bush Wheel 47, similarly fitted to Bush Wheel 46, drives a 50-tooth Gear Wheel on a 3½" Rod 55 that engages with a ¾" Pinion on an 8" Rod 56. A Triple Throw Eccentric,

mounted to give a ¾" throw, has a 4½" Strip 58 bolted to it. A 1" Sprocket Wheel on the Rod 56, drives a similar Sprocket on a 5" Rod 59 which carries a Triple Throw Eccentric 60. To this Eccentric a Coupling is attached by Bolts with three Washers on their shanks, and a 3" Rod fitted with a Rod and Strip Connector is fastened in the Coupling. The Strip 58 is connected pivotally to the lower hole in the Coupling by a bolt. The Eccentric 60 is set in its highest position when the Eccentric 57 is moving the Strip 58 in its farthest position forward.

To set the intermittent motion the 1½" Sprocket Wheel on the Rod 44 is turned so that when its Bush Wheel disengages the Bush Wheel 47, the Eccentric 60 is in its lowest position, and when the Bush Wheel disengages with the Bush Wheel 46, the Eccentric on the Rod 54 is in its highest position. The 1½" Sprocket Wheel on Rod 44 is adjusted in relation to the 1½" Sprocket Wheel 61 so as to ensure that the Pusher operates midway between any two carriers on the endless chains.

Parts required to build the model VertiVeyor:- 8 of No. 1b; 6 of No. 2; 5 of No. 2a; 2 of No. 3; 22 of No. 5; 4 of No. 6; 4 of No. 7; 2 of No. 7a; 2 of No. 8; 4 of No. 8a; 17 of No. 8b; 4 of No. 9; 15 of No. 9d; 15 of No. 11; 15 of No. 12; 1 of No. 12a; 6 of No. 12b; 3 of No. 13; 1 of No. 13a; 5 of No. 15; 6 of No. 15a; 10 of No. 15b; 5 of No. 16; 3 of No. 16a; 2 of No. 16b; 12 of No. 18b; 3 of No. 22; 24 of No. 23; 12 of No. 23a; 3 of No. 24; 2 of No. 24a; 3 of No. 25; 1 of No. 26; 2 of No. 27; 1 of No. 27a; 1 of No. 32; 322 of No. 37a; 261 of No. 37b; 104 of No. 38; 6 of No. 45; 13 of No. 48; 1 of No. 48a; 2 of No. 50; 9 of No. 53a; 2 of No. 55; 2 of No. 55a; 50 of No. 59; 12 of No.62; 3 of No. 63; 2 of No. 64; 20 of No. 69; 2 of No. 70; 1 of No. 73; 20 of No. 76; 1 of No. 79; 2 of No. 80a; 2 of No. 81; 16 of No. 94; 1 of No. 95; 4 of No. 95a; 6 of No. 95b; 4 of No. 96; 3 of No. 96a; 4 of No. 99b; 4 of No. 102; 2 of No. 103a; 4 of No. 103c; 2 of No. 103k; 6 of No. 108; 5 of No. 111; 2 of No. 111a; 16 of No. 111c; 2 of No. 111d; 2 of No. 115; 4 of No. 124; 1 of No. 126a; 2 of No. 130; 2 of No. 130a; 2 of No. 133; 1 of No. 139; 1 of No. 139a; 2 of No. 146a; 1 of No. 155; 14 of No. 163; 21 of No. 164; 1 of No. 166; 4 of No. 188; 6 of No. 189; 3 of No. 212; 1 E20R(S) Electric Motor; 10 Paper Fasteners.