Knud Jørgensen

Nimbus - Technical Development 1934 -1959

English Edition 2016


NIMBUS

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FOREWORD
English edition 2016

The first edition of ’NIMBUS – teknisk udvikling’ was published in 1988 and was reprinted several times. The substantially improved second edition was published in 2005.

This English translated edition with more illustrations is intended for non-Danish speaking readers.

Previously ‘NIMBUS – vedligeholdelse’, published in 2008, was translated into English and issued in 2012 as ’NIMBUS – Maintenance’.

The purpose of this book is clarified in the chapter below, ’How to use this book’. The content of the book is based upon A/S Fisker & Nielsen’s archives, which comprises construction drawings, technical bulletins, sales bulletins, photographs, various brochures, price lists and spare parts lists as well as the manufacturers customer magazine ’Nimbus – Nyt’ (’Nimbus – News’).

A great number of details of the 1934 model is collected in Jens Bisbjerg Andersen’s book ’NIMBUS model C 1934’. The English translation is available on www.geutskens.eu.

The illustrations are in the form of sketches or line drawings. Drawings originated from the factory are marked ’F&N’; all other drawings have been made or modified by the author.

Many thanks to Ben Geutskens, NL, and Richard Reich, GB, for their work on this edition.

Errors or shortcomings remain the author’s responsibility.

Højbjerg, Denmark, 31 October 2016

Knud Jørgensen

HOW TO USE THIS BOOK

This book gives an overview of the technical development of the Nimbus-C motorcycle during the production period 1934-1959.

It is a technical handbook as well as a reference book that can be used to study the Nimbus-C motorcycle in detail, to assess condition of the Nimbus-C, and to refurbish or restore the Nimbus-C. It therefore has an extensive index and in the back a list of key words has been printed. Any part can be found easily by looking it up in the list of key words. In addition, references to other chapters can be found in the text (shown in parentheses).

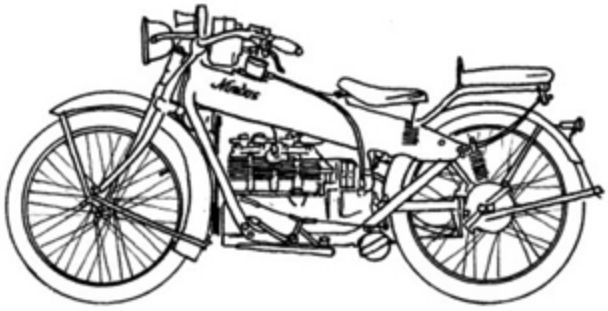
It is advisable to have the spare parts list readily available whenever the book is being used. Reprints of the spare parts list from 1935, 1938 and 1958 are available. Be aware that the 1958 parts list includes all previous parts lists, but if we deal with a pre 1940 motorcycle, it is more appropriate to use one of the re-printed parts lists from the thirties, because they contain photos that clearly show what a particular part from a certain period should look like.

The text fields of the drawings refer to the range of production numbers during which a particular part was used.

HISTORIC DEVELOPMENT

First of all, a short description of the first Nimbus motorcycles, the models A and B, nicknamed the “Stovepipe”.

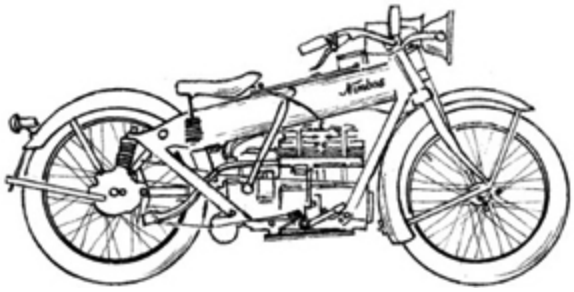
These first Nimbus models were developed and produced between 1919 and 1927 at Fisker & Nielsen Ltd. Copenhagen, Denmark, by electrical engineer Peder Andersen Fisker.



Motorcycles produced from 1919 – 1923 are called ‘Model A’, and those from 1924 – 1927 ‘Model B’.

These models are briefly described here, because some elements from the basic design were also applied to the Nimbus-C. The frame, which gave the motorcycle the nickname »Stovepipe«, was constructed around a sloped large-diameter tube, which had the secondary function of a petrol tank.

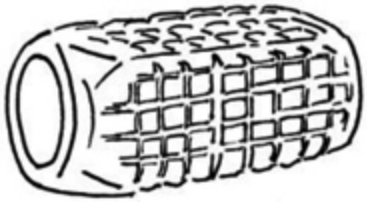
Models A and B are fitted with a 746 cc four cylinder in-line engine, with individually casted cylinders. And like the Nimbus-C, the engines are placed in the frame between two flat iron frame rails.



All Nimbuses are shaft driven, but because Models A and B have a sprung rear suspension, this drive shaft is more complicated and is in fact a ’live’ drive shaft, whereas with the Nimbus- C, the drive shaft was rigid at first but later provided with a flexible/friction intermediate shaft.

While the front fork constructions for Nimbus-A and -B embodied various types of swing (girder fork) suspension, the Nimbus-C is fitted with a telescopic front fork. The method used (bearings, cones, etc) for supporting the front fork at the headstock is identical for all models. In addition to the mentioned head set parts, the ball on the hand-operated gear lever, and the kick starter pedal are identical parts for Nimbus-A, -B and -C. The tool box is virtually unchanged as are the tool bag, and some tools.

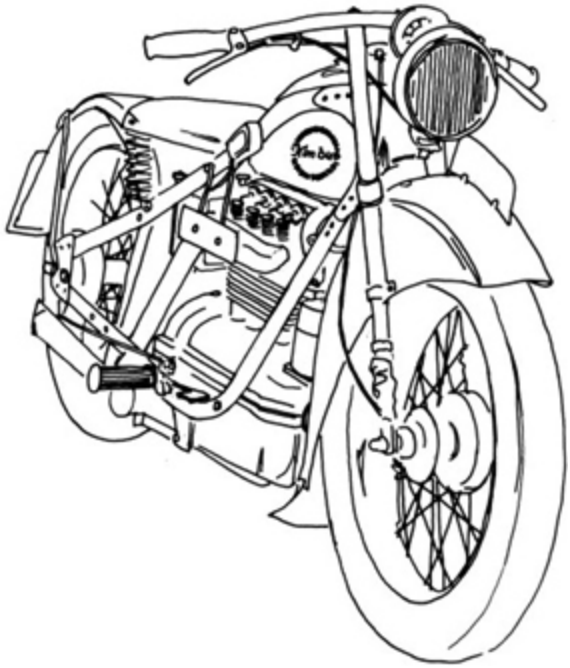
It is worth mentioning that Nimbus motorcycles were fitted with Nilfisk vacuum cleaner parts over the years!



BASIC CONSTRUCTION

Nimbus motorcycles from 1934 until 1959 are called ‘Model C or ‘Type C’. Throughout this book, we have chosen to use the terms ‘Make’ for the Nimbus brand, ‘Model’ for Nimbus-

A, -B and -C and ‘Version’ for ‘Standard’, ‘Standard Extra’, ‘Luksus/Luxus’ and ‘Sport’. The Nimbus-C is sometimes referred to as »Nimbus II«. The suffix ‘C’ is a logical consequence of the fact that Nimbus produced from 1919 – 1923 were called ‘Model A’ and those produced in the following years, from 1924 – 1928, ‘Model B’. Nimbus-A and –B were called ‘Stovepipe’ by the public.



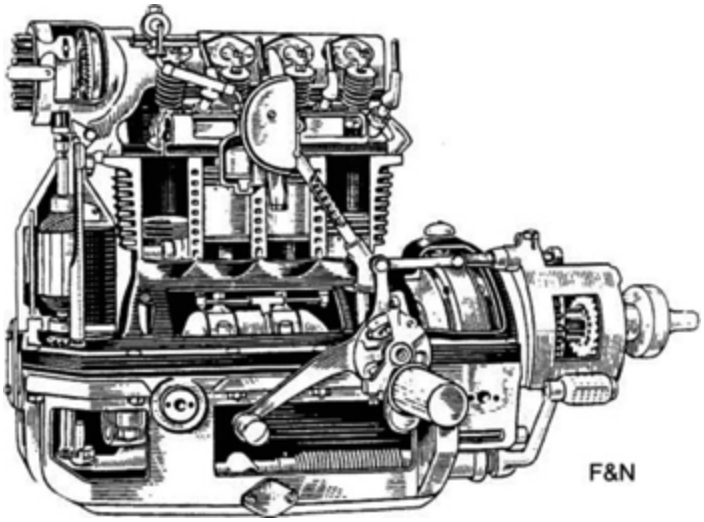
Immediately after launch, because of its distinctive exhaust sound and the shape of its petrol tank, the Nimbus-C acquired the popular nickname ‘Bumblebee’.

Based upon information from the archives, 12,715 Nimbus-C motorcycles were produced. In addition, an unknown smaller number were assembled from spare parts after 1959.

The Nimbus-C was never assembled on an assembly line, but rather in small batches of commonly 25 units. This provided the opportunity to implement many changes along the road. Most of these changes are described in this book, but first of all we will deal with the basic construction, viz.

those parts that remained basically unchanged during the years of production:

The Nimbus-C is a middle weight motorcycle with a flat-steel frame which is formed around the petrol tank and the engine. The front has been fitted with telescopic forks with front wheel, mudguard and flat steel handlebars, and at the rear, with an unsprung rear wheel with mud- guard. Both wheels are fitted with drum brakes; the front brake is operated by a hand lever, the rear brake by a pedal and a pull rod. The fuel tank has a capacity of 12.1 litre, including 1.5 litre reserve.

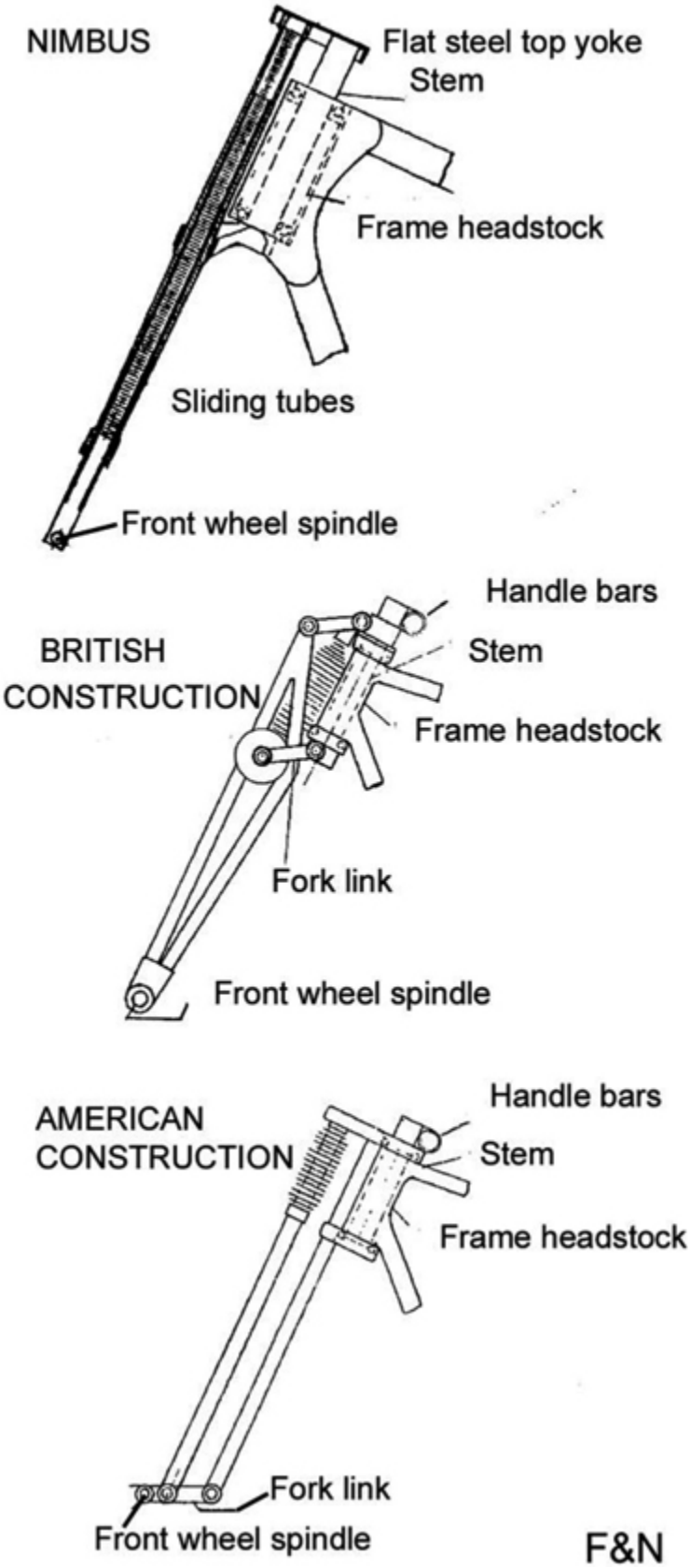


The four-stroke engine is a four cylinder in-line engine with overhead valves and cam shaft. The cylinder block is cast in one piece. It has a standard bore of 60 mm, a stroke of 66 mm and a cubic capacity of 746 cc. The pistons are made of aluminum and come in several versions with different dimensions for different compression ratios and power output (this will be discussed later). The engine is air cooled, partly by means of the cooling fins of the cylinder block and head, and partly by the cooling fins of the aluminum crank case, which functions as an oil sump. The aluminum gearbox- and camshaft housing also play a role in the

cooling. The overhead camshaft is fitted in a aluminum housing and is driven through the dynamo by means of gear wheels on the Crankshaft. The engine’s power is transmitted by a single dry plate clutch, a gear box with three gears and a drive shaft to the pinion and crown wheel of the rear wheel. The lubrication of the Crankshaft, pistons, cam shaft and gear box is done by means of a mechanical oil pump which is driven by the dynamo shaft.

The engine is started by means of a kick starter, which is fitted in the crank case and operated by a pedal arm at the left side of the engine. The carburettor of F&N’s own make is of a horizontal flow type, fitted on the intake manifold; it has a vacuum pipe to the cylinder block.

The flat steel handlebars have one twist grip to operate the carburettor (the throttle twist grip) and one to operate the lights (ignition on/off, main beam / low beam). In addition, there are two hand levers, one for the front brake and one for the clutch. The handlebars have a built-in ignition switch and a push button for the horn. The centre stand and the tool box are placed under the engine. On military machines, the toolbox may be placed behind the pillion seat. Furthermore the frame is fitted with rubber knee supports and foot rests.


NIMBUS
Flat steel top yoke
Stem
Frame headstock
Sliding tubes
Front wheel spindle
Handle bars
BRITISH
CONSTRUCTION
Stem
Frame headstock
Fork link
Front wheel spindle
Handle bars
AMERICAN
CONSTRUCTION
Stem
Frame headstock
Fork link
Front wheel spindle

F&N

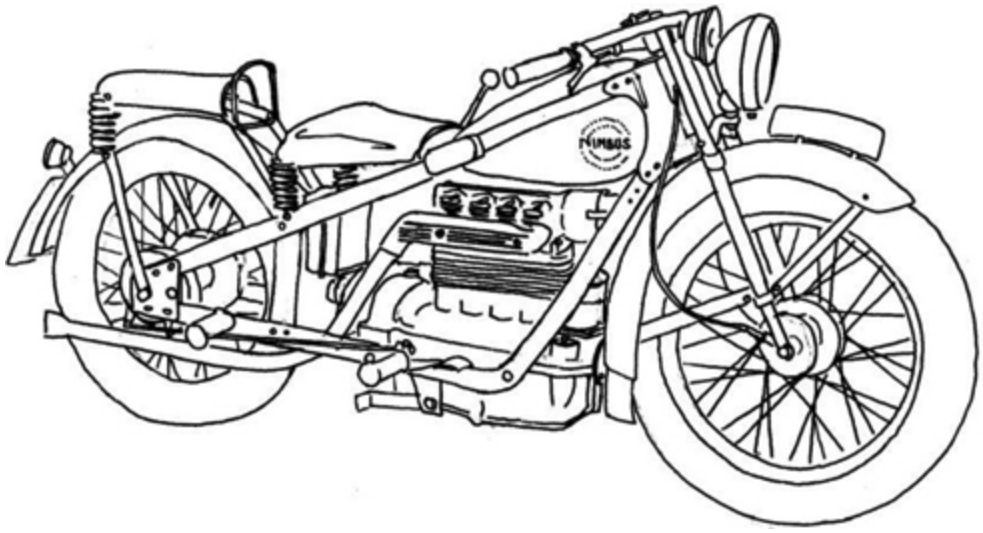
The electrical installation is 6 volts and includes a dynamo, a cutter and voltage regulator, and a battery.

It also features a combined ignition and distributor with H.T. leads and spark plugs. Horn, head and taillights are operated from the handlebars, while the brake light, which is fitted in the tail light housing, is operated through a switch activated by the rear brake lever.

CONTEXT

When the Nimbus-C motorcycle was first launched, it was quite naturally compared with other brands. The front forks especially drew a lot of attention.

A comparison between the front fork design principle of the new Nimbus, the British, and American versions respectively is outlined on F&Ns drawings (shown here on page →).



Construction of the front forks for the Nimbus-C can be seen on a 1933 prototype, built by father

(F&Ndirector) Peder.Andersen Fisker and his son civil engineer Anders Fisker.

In a number of details, the prototype Nimbus-C differs from final production: the most obvious visual differences are the front mudguard and the tail light, as well as the engine oil filling orifice being on the right hand side.

Furthermore, the prototype shows the exhaust pipe apparently fitting *over* the manifold as opposed to the motorcycles produced later in the series, where the exhaust pipe fits *into* the manifold. In addition, the exhaust manifold of the prototype has no heat shield.

This early machine may, however, be characterized as a ‘final version’, which was, at the time, far advanced in a considerable number of engineering aspects. There were problems and shortcomings, but these were corrected during the first year, without any cost to the customer.

PATENTS

When the Nimbus-C, later nicknamed »Bumblebee«, was presented to the Danish press on April 20, 1934, A/S Fisker & Nielsen underlined a number of Danish patents related to the construction of this model.

The advantage of having patents is of course protection against imitation and consequently competition in the market, but also to allow third parties to license the patents and pay for them.

Nowadays there are not many Nimbus-C related patents that are applied in other motorcycles, if any.

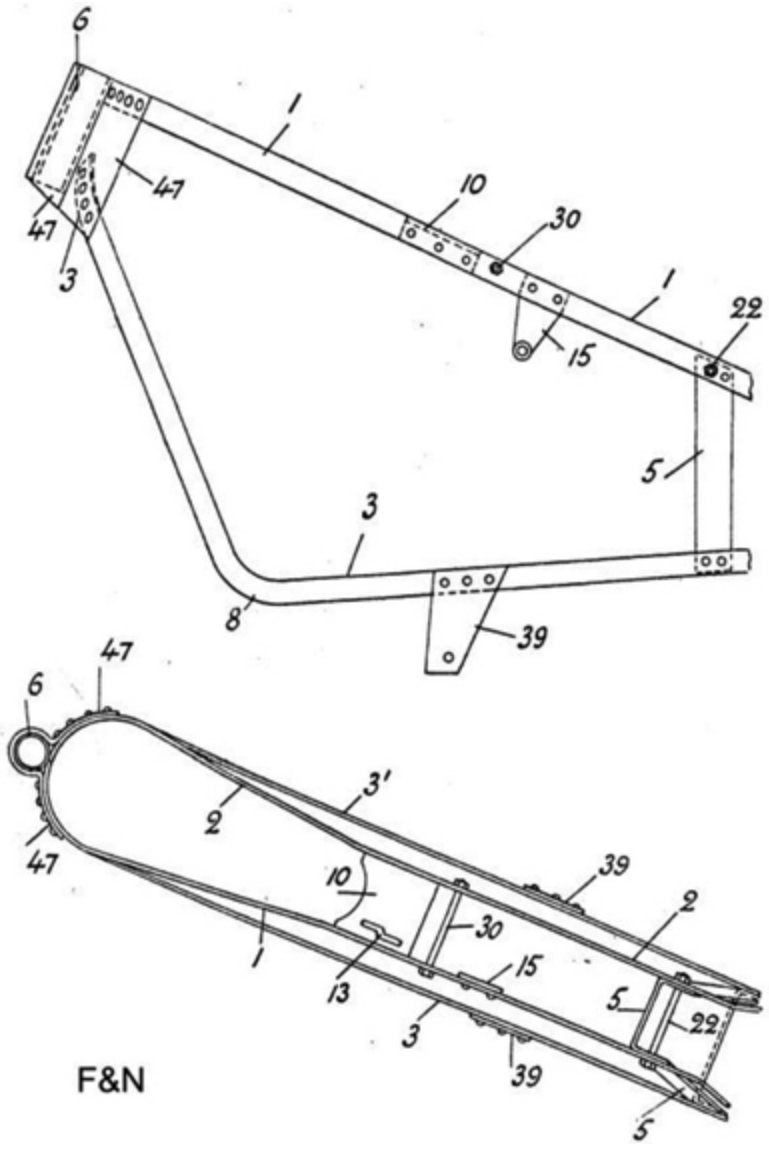
The patents issued from March – April 1933 are:

Danish patent No. 49451

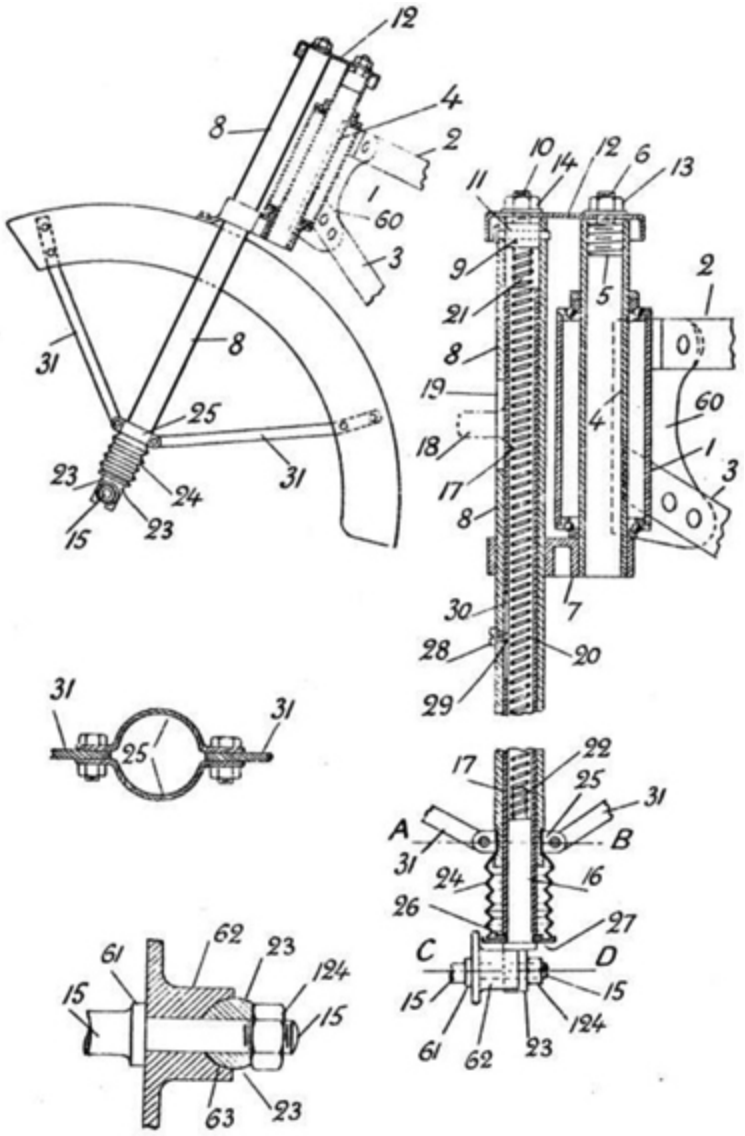
Motor cycle frame

The flat steel frame is one of the most characteristic features of the Nimbus. It is however not the use of flat steel that is chosen to be patented, but the construction of the

frame. The frame embodies the fuel tank and the engine/gearbox and does not just support these. The construction of the frame consequently led to several options that were patented, e.g. the rear mudguard to be hinged and folded back, the position of the centre stand, and the fuel tank fastening. The basic construction of the frame was maintained throughout the years, but the fastening of the headstock varied.



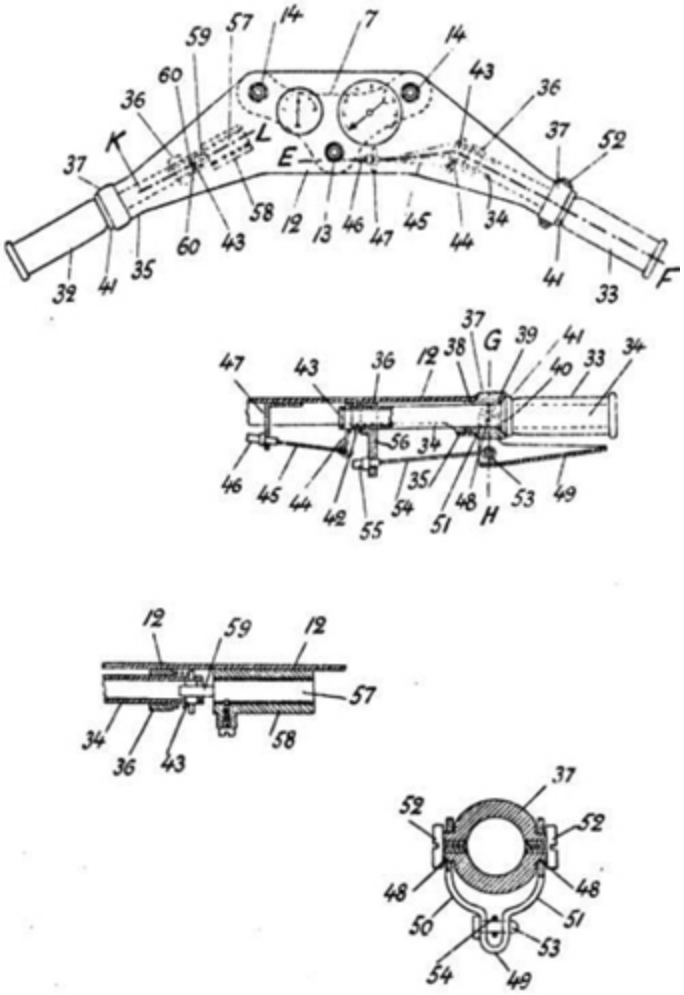
F&N



Danish patent No. 49600

Front wheel fork construction for bicycles, especially motorcycles.

The basic principle of a telescopic spring unit is that a tube can move up and down in another tube. The patent includes both the principle of the telescopic spring suspension as well as the attachment of the front wheel to the front forks. The principle of the telescopic suspension was developed at the same time as BMW in Germany, and remained to be used on all later motorcycles. Apart from that, the front fork is one of the Nimbus-C parts that has seen most changes.

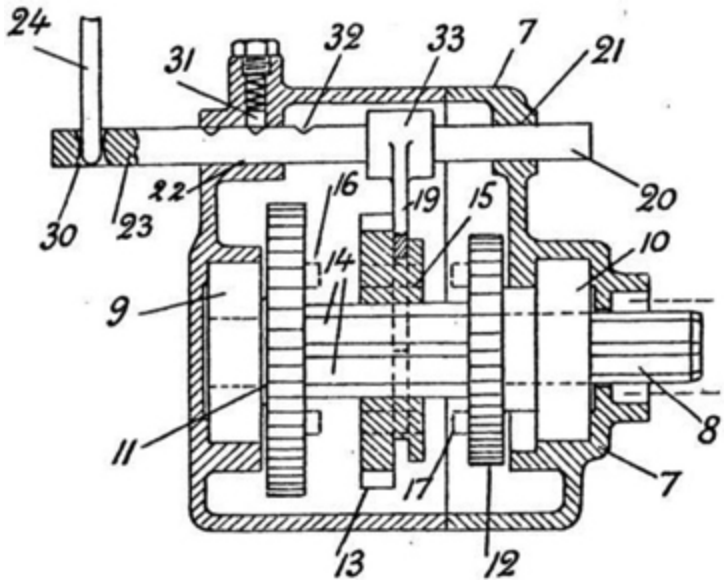


Danish patent No. 49189

Handlebars for bicycles, especially motorcycles.

The flat steel handlebars are one of the most characteristic parts of the Nimbus. This patent refers to the construction, and opens a lot of opportunities. Just consider the light switch. A better way of switching the lights on and off cannot be found anywhere. Furthermore, the flat steel handlebars are used as a dashboard for the ammeter and speedometer.

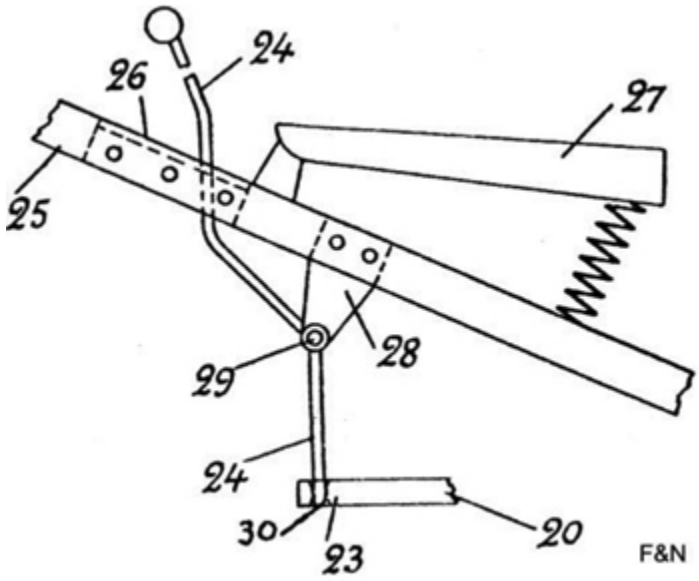
The basic construction of the flat steel handlebars is applied on all later motorcycles, but in time, the outer ends were tilted somewhat and, in combination with the 'high' front forks, the instruments were left out.



Danish patent No. 49734

Construction of the gearbox, especially for motorcycles

Changing gears by means of a hand-change gear lever was most common for motor cyclists in 1934. This patent is only about the simple principle that the gear lever is connected to the gear selector support shaft, by means of an indent in the latter. A foot-change mechanism was introduced as early as 1937, but the hand-change mechanism was not phased out until 1948.

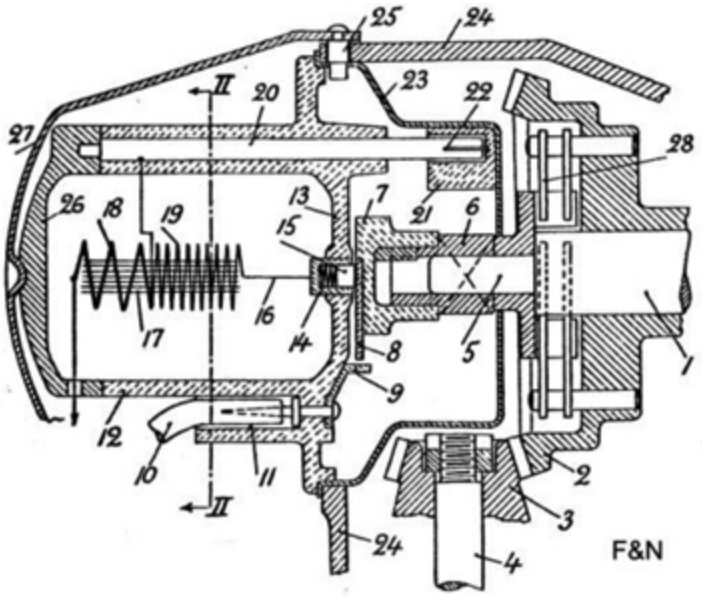


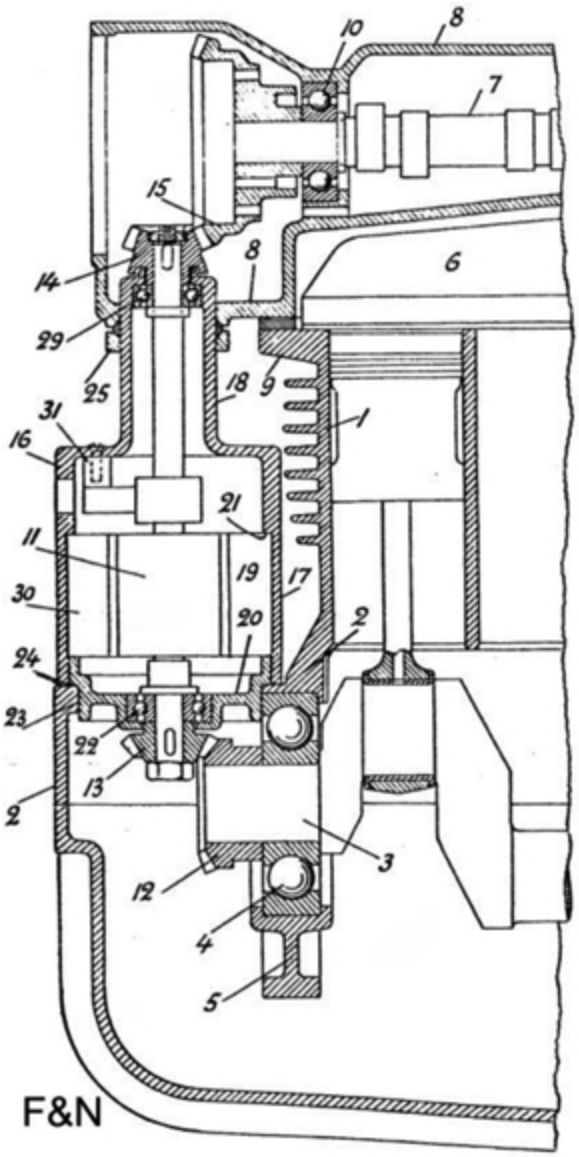
Danish patent No. 48845

Construction of the battery ignition system

This patent is about multiple interrelated aspects, partly about the combined ignition coil and the distributor, partly about the positioning of this combination in the distributor housing by means of a long conductive pin.

This construction has been applied during the whole production period, but the way to limit the rotation of the ignition housing did change.





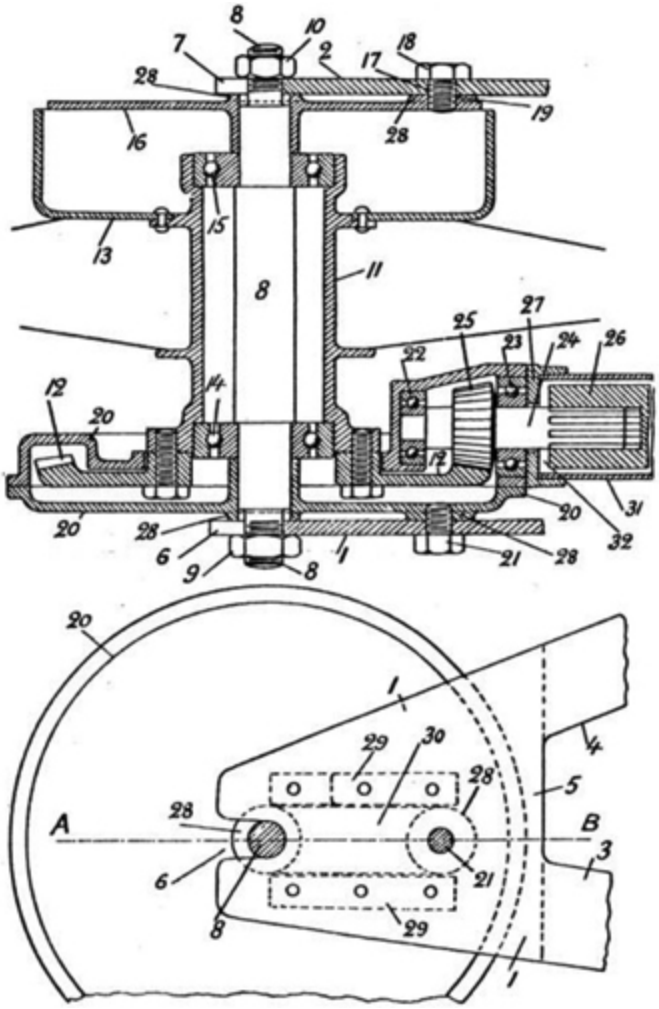
Danish patent No. 49174

Construction of the dynamo-to-engine configuration for motorcycles or similar.

This patent deals with the dynamo being a link in the camshaft propulsion chain, whereby the rotation of the crankshaft is transmitted through the dynamo shaft to the overhead cam shaft. A pinion gear wheel is fitted on either end of the dynamo armature which is engaged with a crown wheel on the crankshaft and the camshaft respectively.

This construction has been used during the entire production period, but the dynamo was almost immediately

replaced with different type from the one shown on the drawing. Please note also that the camshaft on the drawing is fitted in ball bearings as opposed to the final construction, where bronze bushes are used as plain bearings. The mechanical oil pump (lube oil pump) is not on the drawing.



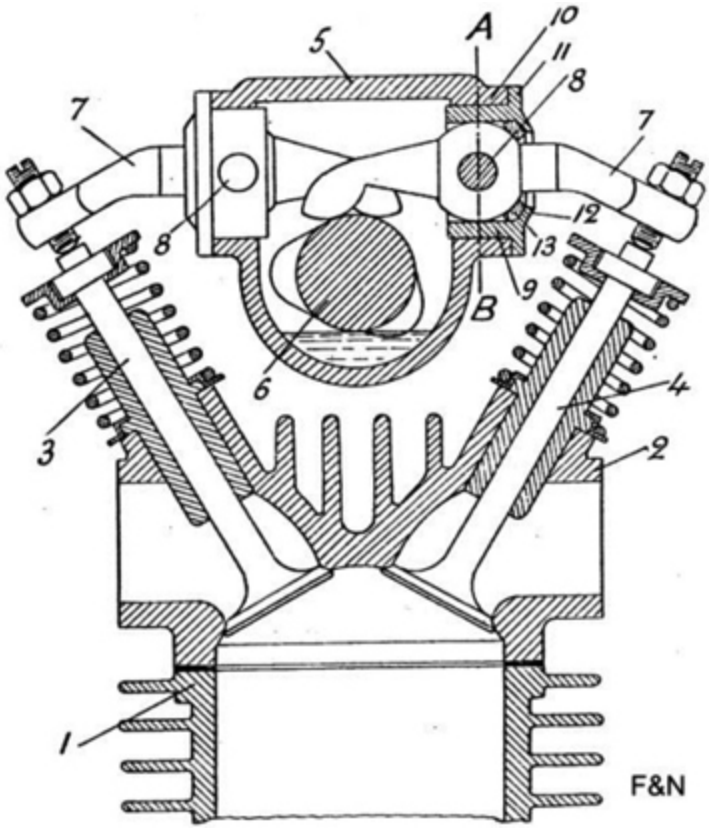
Danish patent No. 48588

Construction of the rear wheel hub and rear frame section for motorcycles.

This patent describes the basic construction that allows the complete rear wheel with transmission and brake to be pulled out of the frame. The two guide rails at either side of the frame, together with the splines of the pinion wheel and

drive shaft, require a stiff, unsprung construction. This construction makes changing the rear wheel less difficult.

The basic construction remained throughout the entire production period. Later, the gear wheel housing was provided with two threaded holes instead of one, for improved frame attachment, and in order to obtain better resistance against the driving torque.



Danish patent No. 49358

Construction of engines, especially for motorcycles and similar.

An engine with an overhead camshaft was not very common in 1934, but the principle was well known. The way the rockers were fitted was new however.

This patent describes the way the rockers are supported in the walls of the camshaft housing. The basic construction described was applied to all engines throughout the entire

production period, the rocker pivots were however later sealed with covers and gaskets.

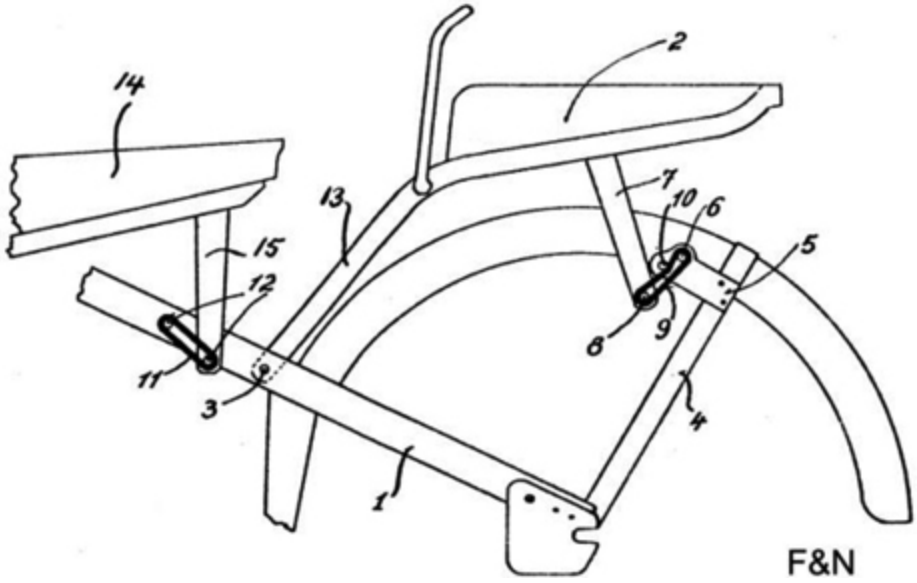
Later additional patents were applied for:

- Suspension of seat and pillion seat
- Rotating valves

Danish patent No. 73411

Seat for bicycles, motorcycles or similar vehicles.

In 1935, the factory used heavy gauge rubber bands for the suspension of sidecar frames; the so-called flat steel frames (see sidecars).



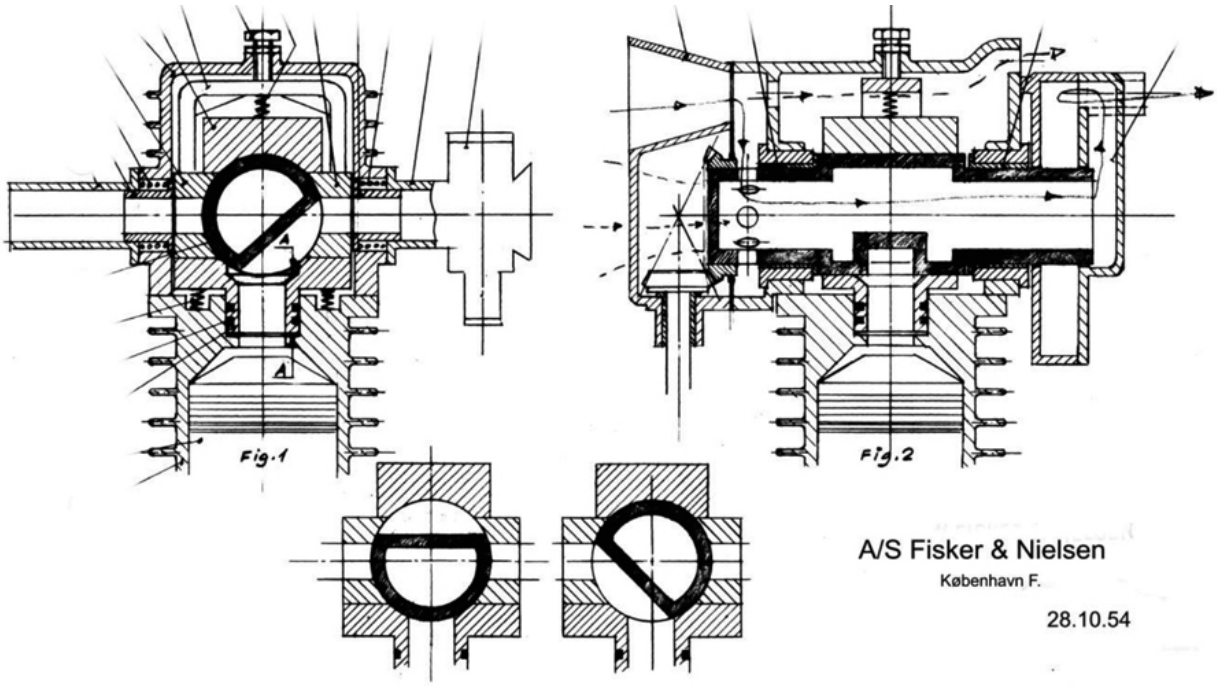
In 1950, from engine no. 9001 onwards, the coil-spring suspension of the seat and the pillion seat were also replaced by rubber bands. The patent was valid as of February 2, 1950 and was applied during the whole production period. This change is considered to be a major improvement in comfort for both the rider and the passenger for unsprung rear wheels.

Danish patent No. 82279

Valve of the rotating type, especially for combustion engines.

This is perhaps the firm's most technologically ground-breaking patent, which can be directly credited to civil engineer Anders Fisker, and chief tester Anton Marinus Andersen. It is valid as of February 2, 1955.

Even though the patent was developed before the production period started, just a few test engines were built with these valves. A more detailed description of the patent is therefore beyond the scope of this book.



REQUIREMENTS FOR APPROVAL

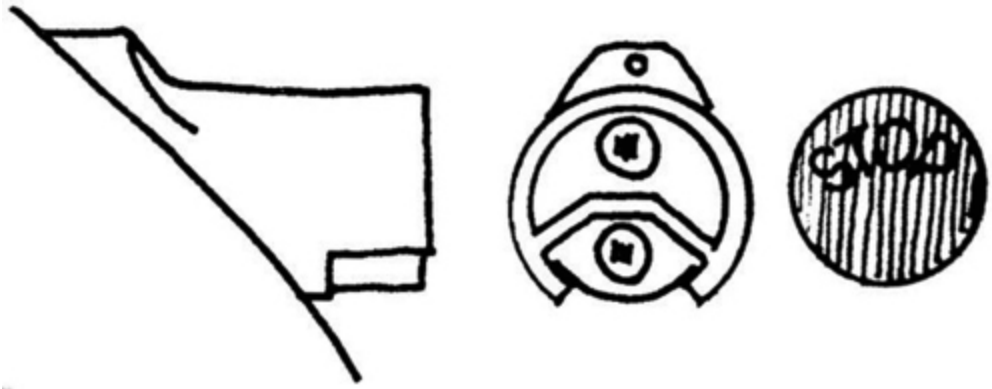
Denmark introduced a new Road Traffic Act in 1932. At the same time the 1903 Motor Law was changed. The Motor Law describes amongst others the provisions for the approval of vehicles. The Motor Law from 1932 describes the requirements applicable to the Nimbus-C from 1934 – 1955.

Every single new vehicle in Denmark had to be approved for registration and this system remained in place until the new law of 1954 was put in place (applicable as of 1955 – 1956)

The number of new vehicles to be approved, increased dramatically, and it was considered to be unreasonable that every single unit of a batch of identical vehicles had to be tested and approved.

Since then a vehicle is registered based upon the current registration regulations in Denmark.

During the production period of the Nimbus-C, a whole series of changes with respect to test requirements affecting the production took place. The factory was prepared for the first change. A marketing brochure dated November 2, 1934 mentions amongst other things:



Brake lights: because of an inquiry related to the brake light regulation, we inform you that this light is already fitted to cope with possible future legislation, so that our motorcycles can quickly be brought in accordance with the law, without any difficulties.

In 1955 the factory again prepared in advance for a new law, which affected the tail light glass with reflector. But it appeared not to meet the requirements. The new glass had

to be replaced after a short time with the ‘J.R.U 129’ marked tail light glass (see the applicable section).

The current (2016) main rule for approval in Denmark is that a motorcycle has to comply with the law, applicable at the time of first approval. This applies amongst others for lights and brakes. But the consequence can be that the vehicle has a limited approval, e.g. riding only by daylight or with limited speed.

Fortunately, the Nimbus-C is approved for Denmark without restrictions. Any doubt is due to the fact that no reference was made to the original design. We hope that this book may contribute to a flawless approval in other countries.

For the Nimbus-C a standard model approval has been issued, but be aware that it is only valid as of frame number 15001, hence as of April 1, 1956.

For the Nimbus-C sidecar a model approval has been issued for sidecar frame RB from June 15, 1948. The approval for the weight is part of it. The weight of the sidecar alone is 45 kg. The weights of the box or coach and the goods have to be added. The total weight of this load may not be greater than 210 kg. So the maximum allowable weight of vehicle and load must not exceed 255 kg.