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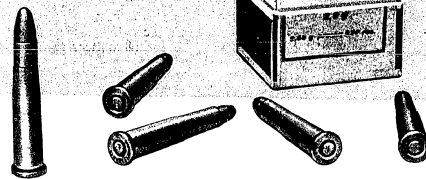
TECHNICAL DATA:

Calibre: .22 Hornet (5.6 x 36 R Ho)
Muzzle velocity: V25 660 m/sec.
Muzzle energy: E25 66 kgm
Barrel: length 380 mm
Safety lock: wing-type, directly locking the striker, securing the breech against undesirable opening
Magazine: 5-round
Stock: choice walnut
Breech: cylindrical, of a normal military design
Weight and length: 2.8 kg at overall length 1050 mm
Cartridge: .22 Hornet (5.6 x 36 R Ho) solid, soft point.



Smallbore rifle fitted with telescopic sight.

Cartridge: .22 Hornet (5.6 x 36 R Ho) with Soft Point or Solid Bullet



KOVO LTD.,

PRAHA - CZECHOSLOVAKIA



Smallbore rifle



of ZBROJOVKA, BRNO, calibre .22 Hornet (5.6 x 36 R Ho)

This is to introduce a new creation of our firearm designers and engineers, the Five-Shot Smallbore Hunting Rifle Calibre .22 Hornet, incorporating all the qualities which have been responsible for the worldwide fame of the Brno (Bren) mark. Every lover of hunting will appreciate the excellent properties of this new gun which is especially suitable for hunting grouse and killing vermin and birds of prey. By accurate shooting, small weight and attractive shape the rifle will soon become an indispensable companion to any hunter.

DESCRIPTION:

Barrel: length 580 mm, six-groove rifling, exchangeable foresight mounted on a base and covered with removable guard. The rearsight is of the three-step leaf design mounted on a solid base. The barrel is made of first-class material and firmly screwed on to the breech.

Breech of a well chosen design is mainly responsible for the attractive appearance of the rifle. Made of fine material, it is solidly connected with the barrel. Special reinforcement around the rearsight prevents the unsafe weakness in the breech due to recessing. The finely guilloched surface protects the shooter's eye from dazzling by reflex glare, when aiming. The bottom part of the breech is recessed for accommodating five-round magazine.

Bolt is locked into breech by two symmetrical teeth behind the cartridge chamber. The bolt is taken out by pressing the catch on the left side and is provided with a safe cartridge extractor. The cocking piece is cocked by turning the bolt handle the same way as with the normal military repetition rifles.

Safety lock is on the right side at the end of the breech. One of the main advantages of this rifle is the ease and speed with which the lock is handled. It secures the striker and prevents incidental opening of the breech. Its design permits equally easy handling even when a telescopic sight is mounted.

Magazine made of pressed steel plates, accommodates five rounds. It can easily be dismantled for cleaning.

Rearsight ensures safe and accurate aiming. It is a three-step leafsight, with one distance (100 m) fixed on the base and two distances (150 and 200 m) on the leaf. The notches have a fine U-shape recess.

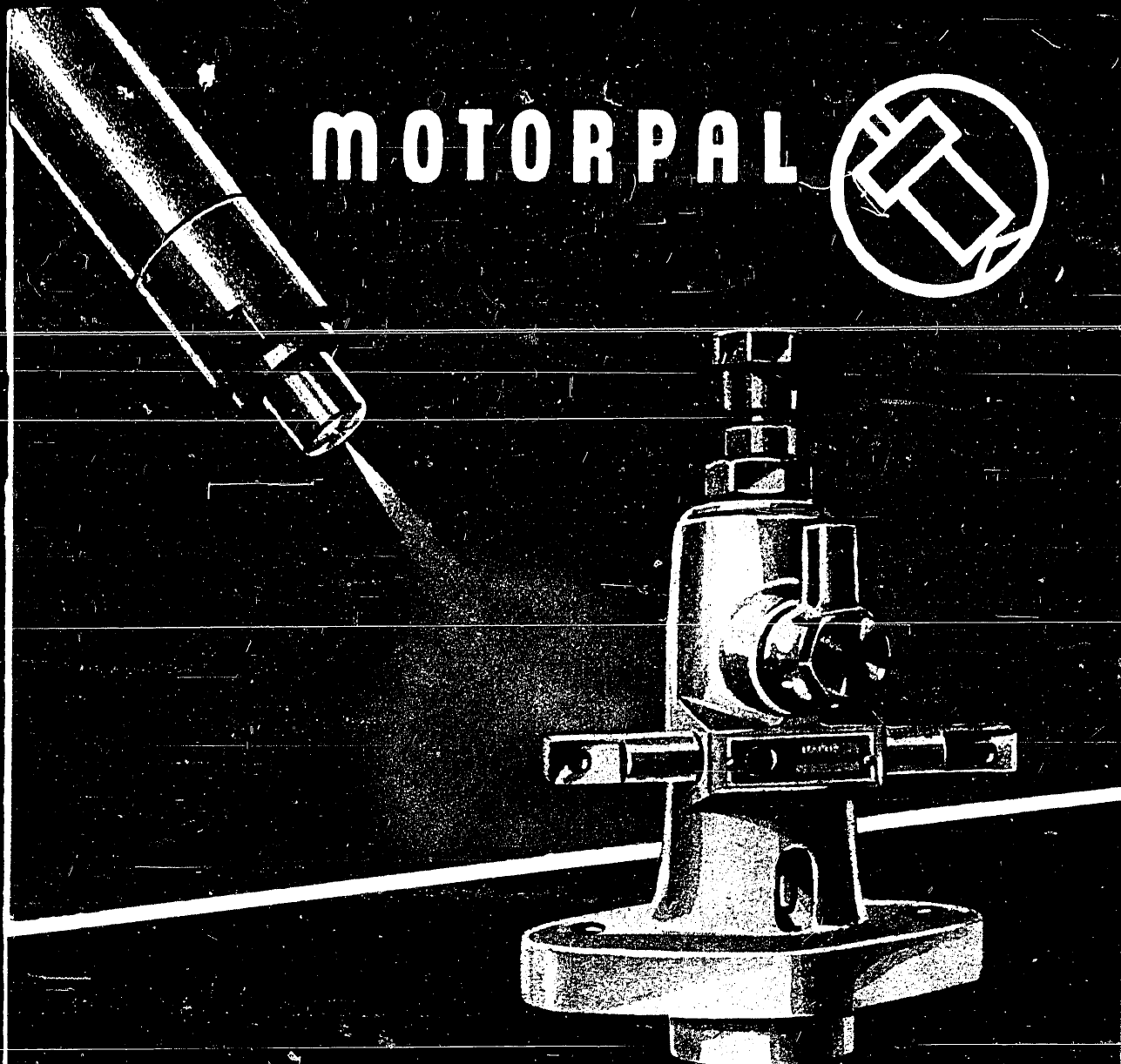
Foresight is interchangeable enabling the use of an instantly best suitable shape and colour.

Trigger is of the approved Brno (Bren) design with stretcher and hair trigger. The sensibility of the trigger pull is adjusted by a screw between the two triggers.

Stock is made of first-class walnut and is of an attractive shape, with pistol grip. The sling clips are shapely, the butt is protected by a hard-rubber pad. The pistol grip and the forestock are finely checkered.



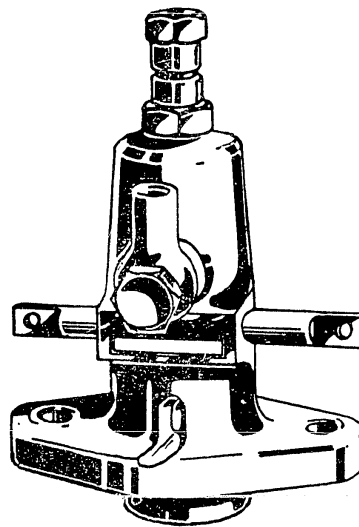
MOTORPAL



INSTRUCTIONS FOR USE
of the Type PC
FUEL INJECTION PUMPS



INSTRUCTIONS
FOR USE OF THE PC TYPE OF
FUEL INJECTION PUMPS



MOTOKOV

LIMITED, VEHICLE AND LIGHT ENGINEERING PRODUCTS IMPORT & EXPORT COMPANY
PRAHA · CZECHOSLOVAKIA

INTRODUCTION

This booklet contains full description of the fuel injection equipment as well as instruction for its mounting, servicing and maintenance. Included are advice on faults most often met with and their remedies.

Read through this booklet thoroughly and follow all the advice given in it. It is the result of the cooperation of our factory, repair shops and maintenance personnel. You will save work and time, ensure the reliability of engine operation and increase the longevity of your motor vehicle as well. The contents is divided into three main groups:

1. Fuel and its filtering.
2. Fuel injection pump.
3. Injector.

I. FUEL (GAS OIL) - ITS FILTERING

Specific gravity at 15° C (59° F)	0.823—0.890
Flash point	56—95° C (133—203° F)
Freezing point	—22 to —12° C (—8 to 10° F)
Viscosity at 20° C (68° F)	1,2—1,8° E
Self ignition point	230—256° C (457—493° F)

The use of clean, guaranteed fuel is the first condition of troublefree operation. Dirty fuel causes serious defects of the fuel injection equipment and nozzle failures with ensuing engine troubles. Fuel must not contain water which might cause engine failure and unfavorably influence the fuel consumption. Water in the fuel can be detected by rubbing a few drops of fuel between the fingers where it appears in the form of droplets. For troublefree operation in tolerably cold weather, fuel with a freezing point —12° C (10° F) must be used. If the frosts are severe, fuel of accordingly lower freezing point must be chosen.

FUEL FILTERING BEFORE THE TANK REFILL

Dirt contained in gas oil settles down very slowly, in contrary to that in petrol, at the bottom of the tank. It is therefore recommended to store fuel in a large container undisturbed for least 24 hours before the tank refill. This container must be provided at the bottom with a drain plug or tap for periodic sludge removal. Pumping over is done from above to prevent whirling up of the sludge and the suction pipe must be placed at least 10 cm (4 in.) from the bottom.

Fuel is poured from the barrels into the container by means of a large funnel lined with fine filter cloth or better still with buckskin. The same procedure must be followed when filling the engine fuel tank. The filtering material

must be washed. Every time it is used. Wire gauze strainers filtering material must be washed. Wire gauze strainers are usually not effective and have proved insufficient. Especially when using synthetic fuel it is most desirable to observe thorough cleanliness, as latent gums which separate it from unseasoned fuel make the plungers and injection nozzles stick. If such fuel is used it is recommended to prolong the settling process.

Partly emptied barrels should not be stored outdoors as penetrating humidity might cause rusting of steel parts. When the outdoor storage of barrels cannot be avoided, care should be taken to thoroughly wipe off water settled round the plug owing to temperature variations.

All vessels and expedients used when handling fuel must be kept absolutely clean and should not be deposited in dirty and dusty places. The best way of keeping them clean is to hang them on dustfree places. Plug the ends of pipes and hoses! Only absolute cleanliness of fuel guarantees troublefree engine operation and the higher expenses for fuel filtering are fully paid for by the saving on the eventual repairs of the fuel injection equipment.

THE FUEL FILTER

is used for trapping all foreign matter contained in the fuel before it enters the fuel injection pump. Two filters are usually mounted on the engines: a pre-filter and a fine filter.

THE PRE-FILTER is mounted into the fuel line in front of the fine filter and consists of a metal edge strainer or fine wire gauze strainer. It serves for trapping coarse dirt particles which settle down at the filter bottom and must be drained from time to time.

Clean the fuel filter regularly.

THE FINE FILTER is mounted close in front of the fuel injection pump and catches fine dirt particles contained in the fuel. Fuel is fed into the upper part of the filter body. The flow is tangential (page I, fig. 1) and the fuel as it enters circulates round the filter element fixed on the centre bolt. By centrifugal force dirt particles are thrown towards the wall of the filter body and drop along this wall without contacting the filter insert. Fuel free from gross dirt passes through the filtering element which retains fine impurities left in the fuel. Then the filtered fuel is fed to the injection pump through an opening in the bottom part of the bolt.

For venting the filter an air vent screw with a cross pin is provided on the filter cover. The sediment at the bottom of the filter body should be periodically drained by unscrewing the plug, mounted in the filter body bottom.

SERVICING OF THE FUEL FILTER. The fine filter must be cleaned regularly after every 50 to 100 hours operation. This period depends, however, on fuel quality. Dirty fuel necessitates a more frequent cleaning of the filter. Before removing the filter element, the sludge drain plug should be unscrewed. The inside of the filter body is rinsed with fuel oil and only then should the filter element be taken out. In this way the sediment is prevented from entering the outlet for filtered fuel.

The filter cloth or felt insert (page I, fig. 4 and 3) is washed in clean petrol or paraffin and cleaned from inside by compressed air. If there is no compressed air available, the felt or cloth insert is taken off the holder and rubbed in the hand. Reject filter elements that have already been cleaned three times as they get clogged faster and the quality of filtration is not sufficient after their prolonged use. Don't use wire brushes for cleaning! Check cartridges

for holes or other defects. When damaged, the filter elements must be replaced.

Paper filter cartridges (page I, fig. 5) cannot be cleaned. They must be stripped off and the filtering paper changed. When assembling, the entire insert must be well tightened and only then secured with lock wires, to prevent dirty fuel from penetrating through fissures.

For the replacement of a clogged filter paper insert, a spare cartridge in a tin box, should be always kept for immediate use.

DOUBLE FUEL FILTERS. For engines requiring particularly clean fuel, and where replacement of cartridges must be done during engine operation, double filters are mounted. They are two complete single filters arranged in one. When cleaning or repairing during engine operation, the respective part is shut off, leaving only the other working. At the bottom of the filter body a special change-over bolt is provided. By turning this bolt properly either both parts can be set working, or one or the other, eventually both of them can be shut off. For easy manipulation the bolt has marks indicating the position of the ports.

FUEL PIPING

The fuel feed line is ascending to avoid formation of air pockets. Avoid sharp bendings! Before being mounted, pipes must be thoroughly cleaned from scale and other dirt which could be the origin of fuel injection equipment failure.

Packings of the corner connections must be firmly tightened to prevent air getting into the fuel or fuel leakage. Never mount used packings (connection nipples) and always have spares in hand.

II. FUEL INJECTION PUMP

This is a plunger type pump of constant stroke and sleeve control of injected fuel quantity. The pump has to supply precisely timed and accurately metered quantity of high compressed fuel into the engine cylinder. The injected fuel quantity is metered from zero to maximum by rotating the plunger provided with a helical (metering) edge according to the momentary load of the engine.

The PC fuel injection pumps, also called pumps without cam gear because the driving camshaft is not a part of the pump itself but a part of the engine, are usually made as single cylinder units. Several injection units are mounted on multi-cylinder engines. MOTORPAL produces seven sizes of the PC pumps with constant stroke from 7 to 35 mm (0.275 to 1.378 in.). Every unit may be equipped with a set of working plungers with diameters increasing adequately with the stroke of the pump. (The pump with 7 mm stroke has a 4.5 and 6 mm plunger diameter (0.177 and 0.236 in.), the largest pump with a 35 mm stroke has a plunger of 20, 22, 25, 27 and 30 mm diameter (0.787, 0.866, 0.984, 1.0630 and 1. 811 in.).

Nevertheless, pumps of smaller sizes are designed also as multi-cylinder units so that two, three, or four single pump units are joined in one housing.

DESCRIPTION OF THE FUEL INJECTION PUMP (page IV). The pump barrel 202 is mounted in a light metal housing. In the barrel there moves a plunger provided, on its upper part, with a helical (metering) edge. The working chamber of the plunger is closed by the delivery valve 225 which is forced in its seat by the delivery valve spring

Clean fuel prolongs the life of the fuel injection equipment.

227. The pump barrel and delivery valve seat are tightened by the delivery union 228 to which the delivery line to the injection valve is connected.

The pump plunger is actuated by means of a cam, placed in the engine housing, and an adjustable tappet 8 (page VI) which rests on the cam follower 221. The plunger is forced by the spring 215 and the spring plate 216 against the cam follower. The pump element 202 is secured against turning by barrel locking screw 210. The air vent screw 246 allows venting of the fuel injection pump suction chamber. The lugs pressed in the bottom part of the plunger rotate the plunger in order to change the amount of fuel injected. The lugs engage in the control sleeve 213 which is provided with gears for one-cylinder pumps or with an adjustable toothed segment for multi-cylinder pumps. With its teeth meshes the toothed control rod 206. The PC fuel injection pumps are made of first class turning material and the greatest care is given to its working up. The most important parts, i. e. the plunger and barrel, the delivery valve and delivery valve seat are made with an accuracy of tenthousandth of an inch and are precisely mated. Individual parts are therefore interchangeable as pairs only.

OPERATION OF THE FUEL INJECTION PUMP. At the down stroke (the bottom dead centre of the plunger) the inlet port of the barrel is uncovered and fuel enters from the suction chamber filling up the space above the plunger. As soon as the rising plunger closes the inlet port (fig. 1 and 3), fuel is under pressure and the rising plunger forces it through the delivery valve and delivery line to the nozzle. Delivery of fuel continues until the helical edge of the plunger (fig. 4) uncovers the bypass inlet port. The plunger groove underneath the helical edge is in connection with the communicating groove through which, with the plunger in this position, fuel flows from the

king chamber to the suction chamber of the injection pump. At the same moment as the pressure is relieved, the delivery valve closes. On the down stroke of the plunger the inlet port of the barrel is again uncovered, fuel fills up the pressure chamber and the cycle is repeated.

The amount of fuel delivered is varied by the rotary movement of the plunger, i. e. by the duration taken to cover the inlet port of the barrel. As mentioned above, the plunger is rotated by the control rod 5, meshing with a toothed segment of the geared control sleeve 6 (for one cylinder pumps) which, again, engages the lugs of the plunger. By sliding, the control rod turns the plunger 4 and the helical edge 13 uncovers the inlet port 12 sooner or later. Thus the duration of the injection and the quantity of fuel injected is varied. If the pump does not have to deliver fuel at all, the plunger should be turned, till the communicating groove connecting the crown of the plunger with the groove below the helical edge, uncovers the inlet port (page V, fig. 5). In this case the control rod is in its extreme position marked by an arrow and STOP.

When determining the plunger diameter, not only the injected fuel quantity but also the injection speed must be taken into account. To shorten the duration of the injection, a plunger of a larger diameter is to be chosen without changing the cam, or a cam of a steeper characteristic is to be chosen preserving at the same time the unaltered plunger diameter.

The delivery valve mounted above the pump barrel, separates the working chamber from the delivery piping, after the injection is finished. Moreover, the valve is destined to reduce the pressure in the fuel line to the required minimum. To serve this purpose, the valve is provided with a cylindrical section which, after separating both spaces, i. e. the working chamber of the plunger and the delivery

tubing space, moves further towards the plunger. By this movement the fuel delivery line capacity is increased and the pressure of fuel is reduced. This arrangement tends to suppress the pressure valves which are running through the delivery line after every injection and might cause secondary injection. By relieving the delivery tubing the so-called dribbling of oil from the injection nozzle caused by a loose seat is prevented. Dirt on the seating face of the valve may cause fuel leakage. Carbonisation of the nozzle holes due to this dribbling changes the injection characteristic and may even clog the holes (if hole nozzles are used).

The pump plunger needs no lubrication, only the cam follower requires periodic lubrication.

If the engine is stationary for a period of more than six months, fuel in the injection pump thickens and the plungers and delivery valves may stick. This may be prevented by running the engine on paraffin for 15 minutes before stopping.

MOUNTING THE FUEL INJECTION PUMP ON THE ENGINE. Fuel injection pumps are normally mounted on the engine vertically. The mounting height should be such that the pump plunger does not touch the delivery seat valve in its upper position nor the cam follower touch the spring plate in the lower position. An inspection cover plate facilitates the proper setting. The cam follower bears a mark which must be visible at both extreme positions of the plunger through the inspection plate (page VII, fig. 1 and 3). The commencement of the fuel delivery (not of injection) is indicated on the inspection cover plate by a mark, coinciding with that on the cam follower (page VII, fig. 2).

FUEL PIPING. The delivery piping connecting the pump with the injector should be ascending and without sharp

bends. The tightening nipples are either brazed or better directly cold swaged on the pipes. Before mounting, pipes must be thoroughly cleaned from scale and other dirt which might cause injector failures.

VENTING THE FUEL INJECTION PUMP. Venting is necessary every time any union is unscrewed, any part of the delivery piping or injection pump is stripped, after the engine has been stationary for a long time or when the tank is emptied.

Loosen the air vent screw on the filter body as well as the air vent screw of screw on the injection pump. Let the fuel flow from the gravity feed tank (for a small engine it should be at least 0.5 m (20 in.) above the injection pump) till the fuel running out round the vent screw contains no air bubbles. Then the vent screw is tightened and the fuel flowing out around the vent screw of the injection pump is examined. Where the injection pump has no air vent screw (the smallest type of injection pumps), the banjo plug has to be slightly loosened.

With the control rod of the injection pump is in the maximum delivery position, prime by means of the hand priming device mounted on the engine till the fuel line from the injection pump to the injector is filled with fuel. — If there is no fuel delivery, the discharge union nut has to be loosened and priming resumed. The outflowing fuel must not contain any air bubbles.

Check the oil level.

FAULTS AND THEIR REMEDIES

In the event of the engine refusing to start or in the event of other troubles first ascertain whether the pump or pumps deliver fuel or if the trouble is caused by the nozzles or by the engine. To find out loosen the discharge union nut of the injector at full delivery position and prime to check delivery.

I. Fuel injection pump does not deliver fuel.

Possible causes:	Remedies:
1. Lack of fuel.	
a) Fuel tank empty.	Refill tank.
b) Cock in the fuel feed line closed.	Open cock.
c) Fuel filter or fuel piping clogged.	Clean and vent thoroughly.
2. Air in the injection pump - when loosening the air vent screw or delivery union the outflowing fuel contains air bubbles.	
3. The pump sucks air from the filter.	Prime until fuel flows free from air bubbles.
a) Damaged valve.	Vent air from fuel filter and injection pump as well.
b) Spring broken.	Clean valve and valve seat; replace if damaged.
a) Plunger or barrel seized.	Replace.
4. Delivery valve sticks.	
5. Pump plunger sticks.	Replace plunger and barrel.
b) Plunger spring broken.	Replace.

II. Fuel injection pump works irregularly.

Possible causes:	Remedies:
6. Insufficient fuel delivery:	Refill.
a) Too little fuel in the tank.	Increase inlet descent.
b) Inlet descent insufficient.	Clean and vent thoroughly.
c) Fuel Filter or piping clogged.	As for 2. or 3.
7. Air in the injection pump.	As for 4.
8. Delivery valve sticks.	As for 5.
9. Pump plunger tight or sticking.	Clean the valve seat; if damaged, replace delivery valve.

III. Fuel injection pump delivers too little or too much fuel:

Possible causes:	Remedies:
10. Delivery valve loose.	Tighten well or, if necessary, replace union washer.
11. Union loose.	Reset toothed segment so that its mark corresponds with the mark on the sleeve. Tighten the screw of the segment well.
12. Toothed segment of the control sleeve loose (in multicylinder pumps).	Reset tappet setting screw and tighten.

IV. Commencement of delivery displaced:

Possible causes:	Remedies:
13. Tappet setting screw loose.	Replace cam.
14. Damaged cam.	

V. Control rod sticks.

Possible causes:

- 15. Pump plunger sticks.
- 16. Control rod stiff.

Remedies:

- As for 5.
- Clean injection pump.

Use fuel of guaranteed quality only.

III. INJECTORS

The injector unit embodies two main parts, e. g. the nozzle holder and the injection nozzle which atomizes the injected fuel into the combustion chamber of the engine. The pressure of injected fuel acts on the cone of the nozzle valve (on the principle of hydraulics) causing the valve to open against the pressure of its preloaded spring mounted in the nozzle holder. By varying the spring load the opening pressure of the nozzle is altered.

NOZZLES

According to the type of engines, two basic types of nozzles are supplied, e. g. the pintle nozzles or the hole nozzles. Both the types of nozzles consist of two parts: the nozzle body and the nozzle valve (needle). Material used for the production of these parts is of first class quality and much care is devoted to its working up. Both parts have mating surfaces with clearances of tenthousandths of an inch and are interchangeable as pairs only. For this reason repairs of nozzles are not recommended.

Injection nozzles are manufactured in current sizes and types and also special purpose nozzles are supplied.

THE PINTLE NOZZLE (page VIII, fig. 1) ends with a pintle which projects from the nozzle body. A grinded cone on this pintle sprays the injected fuel in the necessary direction. Different engines require different spray angles. These nozzles are designed for pressures up to 200 atm. (850 lbs per sq. in.) and are used mainly in engines with precombustion chambers.

THE HOLE NOZZLE (page VIII, fig. 2 and 3) has one or more injection holes. With current production multi-hole nozzles the hole angle is given by the arrangement of the

holes. Hole nozzles are made for opening pressures up to 300 atm. (4.250 lbs per sq. in.) and are commonly used for direct injection engines where fuel must be evenly dispersed and well atomized.

CLEANING THE INJECTION NOZZLES. A dirty or clogged nozzle is cleaned by means of a wood splinter and washed in fuel oil. It is recommended to clean the nozzle holes with a special hole cleaner of suitable size. The nozzle valve is cleaned with a clean cloth. Hard or sharp tools or abrasives of any kind are to be avoided.

Before assembling, the nozzle body and the nozzle valve should be washed in clean fuel oil to make the nozzle valve slide freely in the nozzle body. The lapped contact faces of the nozzle holder and the nozzle body are to be cleaned and only then should the nozzle be tightened into the holder. By hand priming ascertain whether the nozzle valve opens sharply and whether the injected fuel is properly atomized. A sticking or loose needle makes fuel spray in a compact beam. A good nozzle function may be recognized by the hollow sound accompanying the opening of the nozzle. A good nozzle pops or chatters, a bad one emits a creaky sound.

While testing nozzles, especially hole nozzles, protect hands and face against the spray. The beam may cause even painful injuries.

NOZZLE HOLDERS. The nozzle is held in the cylinder head by the nozzle holder which also connects the nozzle to the delivery line of the injection pump. Even nozzle holders are standardized and are classified into two main groups:

VN holders (page IX, fig. 2, page X, fig. 1) which are held in place by means of special clamps and VZ holders (page IX, fig. 1) held by an attachment bolt on the holder stem.

DESCRIPTION (page X, fig. 1). Fuel flows from the injection pump to the delivery connection stud 712 or 713. The delivery connection may have mounted on an edge type filter 714 which retains dirt particles larger than 0.02 mm (0.0008 in.). Fuel is fed through an axial passage drilled vertically in the stem ending at the lapped face of the holder which corresponds to the annular groove on the nozzle body. In the centre bore of the nozzle holder is a feeler pin 702 transferring the pressure of the spring 703 onto the nozzle valve. The spring load and opening pressure of the nozzle may be adjusted by the setting screw 705 which is locked with the nut 706. After setting the pressure, the protecting cap nut 707 is screwed on. Fuel leaking around the nozzle valve flows through the centre bore round the feeler pin 702 and is returned into the fuel tank by the leak-off banjo union stud 721. The banjo may be mounted either on the opposite side of the fuel inlet, or on the same side, or in the protecting cap 707. When one cylinder of the running engine has to be used as a compressor for filling air bottles, the screw 733 on the injector body enables the injected fuel to by-pass into the leak-off tubing without reaching the nozzle (page IX, fig. 2).

Two types of the nozzle cap nut 732 are manufactured. The short one is used for nozzles inserted into the cylinder head, the long nozzle cap nut for engines where the nozzle requires better cooling.

INJECTOR ASSEMBLY. Assemble the nozzle with loosened spring 703 to get proper fitting and good centering of the nozzle valve into the centre bore of the nozzle holder. For a good engine performance and low fuel consumption, the injection pressure and its proper setting is of paramount importance. Starting of the engine may be diffi-

Check the opening pressure of the injection nozzles.

cult or even impossible by misadjustment of the injection pressure. Therefore when setting it use a nozzle tester with a precise pressure gauge! Then secure properly the adjusting screw. The injector body must be properly tightened to the cylinder head so that it is evenly joined to the whole seating face. The function of even a good nozzle may be influenced by faulty tightening of the injector. Never fit used or deformed washers.

I. Nozzle loose.

Possible causes:

1. Contact faces between the nozzle and holder are either dirty or, due to faulty assembly, the nozzle body is not well seated.
2. Excessive clearance between nozzle and nozzle valve, due to wear, or the nozzle valve crossed by one side pressure of the washer, owing to faulty assembly of injector.

Remedies:

- Remove dirt from the contact faces, mount holder with nozzle centrally and tighten evenly to the cylinder head.
- Replace worn nozzle or defective washer and reassemble the injector as sub 1.

II. Nozzle drips.

Possible causes:

3. Nozzle dirty and nozzle needle leaky.
4. Nozzle valve seized.

Remedies:

- Dismantle nozzle and clean the body and valve carefully in clean fuel.
- Slightly damaged nozzle needle and body repair carefully and lap in clean fuel oil. Major defect requires nozzle replacement.

III. Nozzle does not atomize fuel.

Possible causes:

5. Nozzle sticks or is seized.

Remedies:

- Repair nozzle body and nozzle valve carefully as sub 4.; damaged nozzle is to be replaced.

Clean fuel prolongs the life of the fuel injection equipment.

- | | |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 6. Nozzle holes clogged. | Clean carefully. Dirt in the nozzle is a sign of bad fuel filter condition; it means filter cleaning or replacement. |
| 7. Injector spring broken. (Engine knocks and loses power.) | Replace spring. |

Clean the fuel filter regularly.

EPILOGUE

The necessity for thorough cleanliness mentioned in the chapter dealing with fuel and its filtering is of still greater importance when handling dismantled fuel injection equipment.

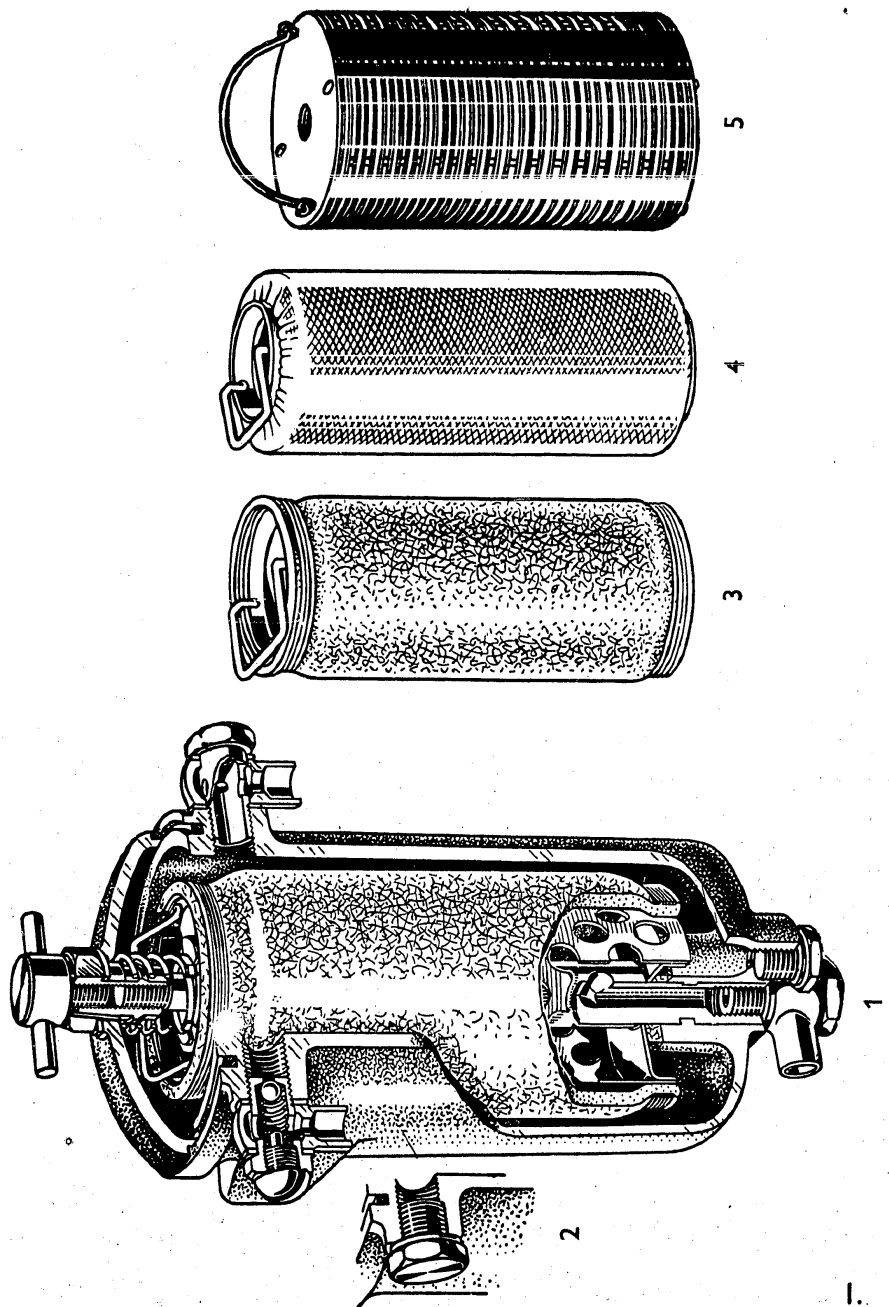
Repairs must be carried out with the utmost care. When dismantling or assembling fuel injection pumps, suitable special tools should be used to avoid whatever damage of the precision parts. Stripped parts should be laid only on absolutely clean places, preferably on a sheet covered bench. Do not touch lapped parts, especially injection nozzles with bare fingers for even this touch might soil them. Whenever handling dismantled fuel injection equipment, the parts should be washed in large receptacles filled with paraffin or clean fuel oil.

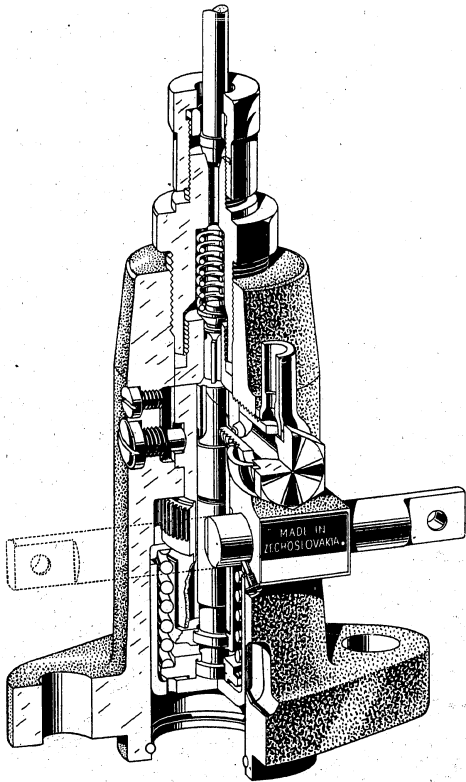
Beware of interchanging individually mated parts, e. g. injection pump plunger and barrel, delivery valve and delivery valve seat, nozzle valve and nozzle body, etc. Before reassembly all these parts must be absolutely clean and washed in fuel oil or paraffin.

After any major repair of the fuel injection pump, e. g. replacement of plungers, delivery valve etc. (multi-cylinder pumps), the injection pump must be readjusted for the delivered fuel quantity. This resetting should be carried out only on a test bench in special fixtures by skilled specialists. Entrust this work to service stations or repair shops and to qualified mechanics only.

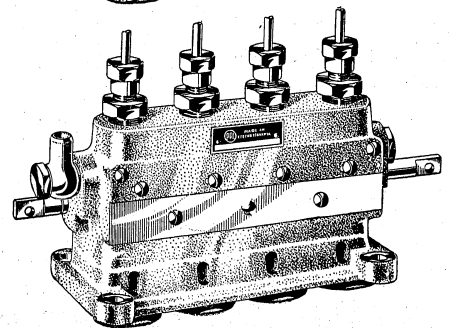
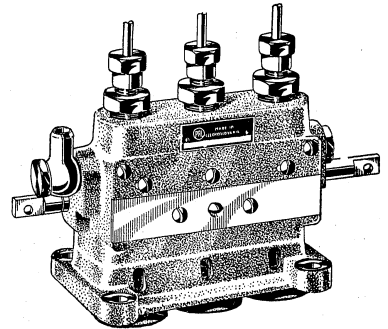
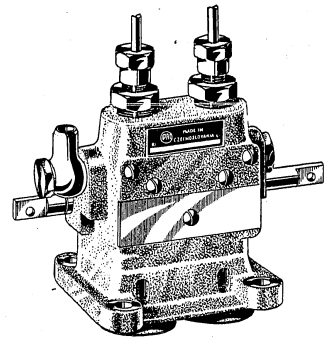
Before mounting a repaired fuel injection pump on the engine, it is absolutely necessary to check the fuel injection pump with the control rod in the position »STOP« for fuel delivery. In this position the fuel injection pump should not deliver fuel at all; otherwise the plunger is overturned by

180°. The importance of the proper setting of the injector to the rated opening pressure has been already emphasized in this instruction booklet. Check the opening pressure of the nozzle regularly every 2,000 km (1,200 miles) or after 40 operational hours, later on every 5,000 km (3,000 miles) or 100 hours. In our repair shops this checking is carried out on special nozzle testers which, on request, are supplied to our customers.



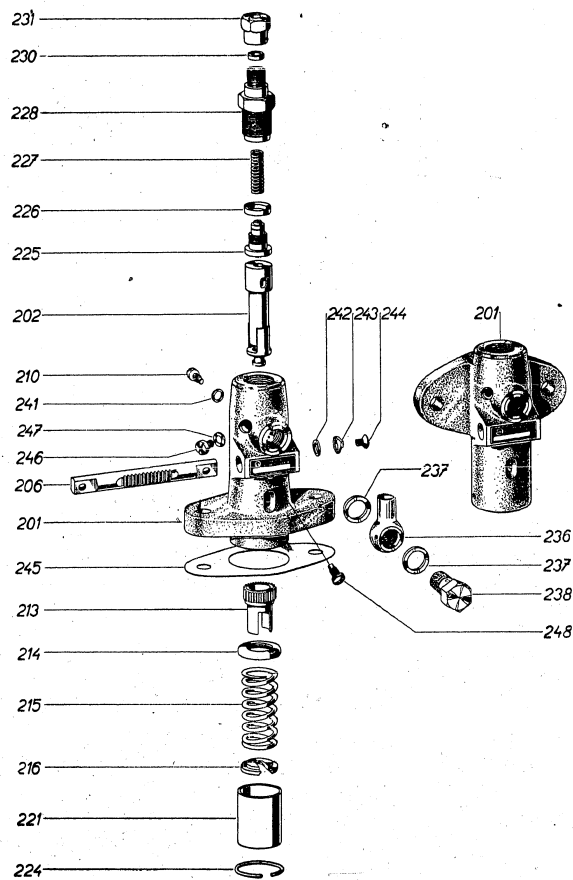


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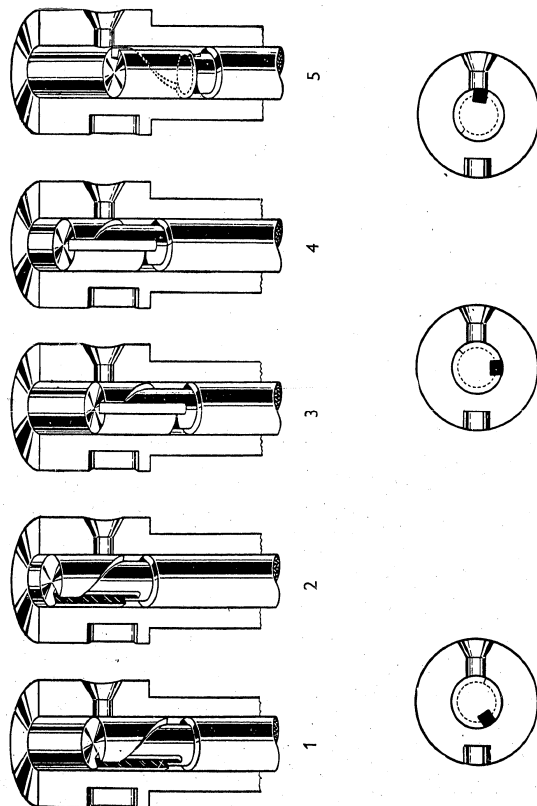


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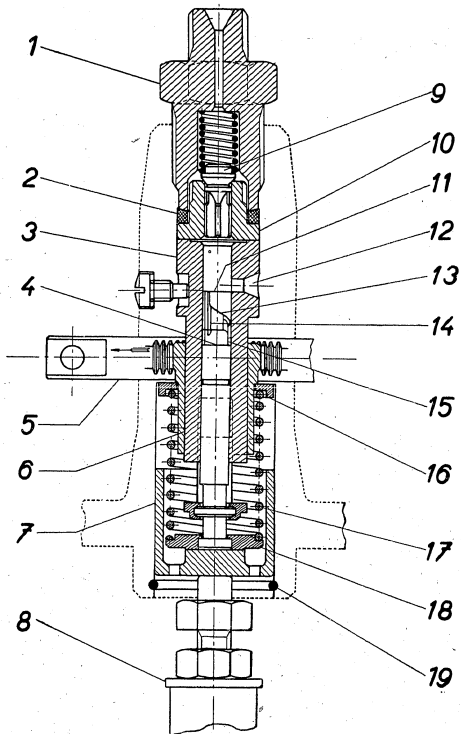
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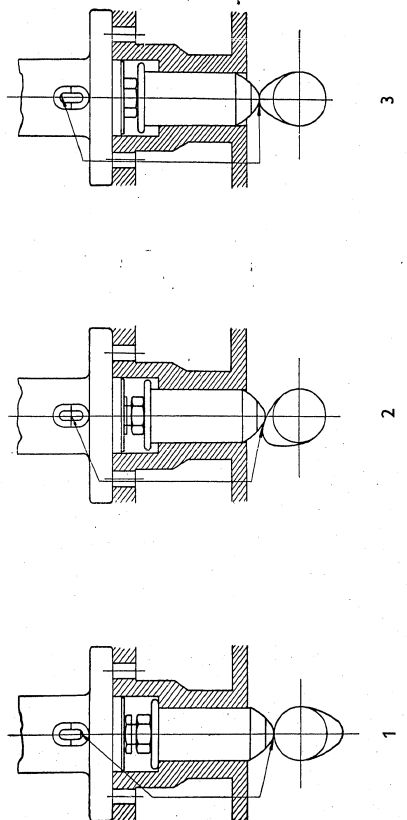
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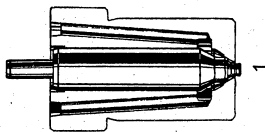
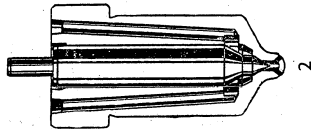
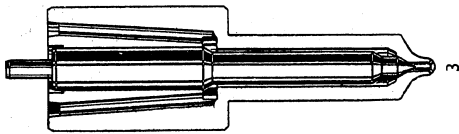


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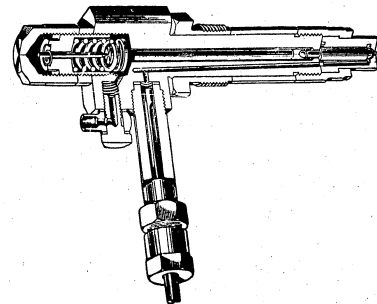
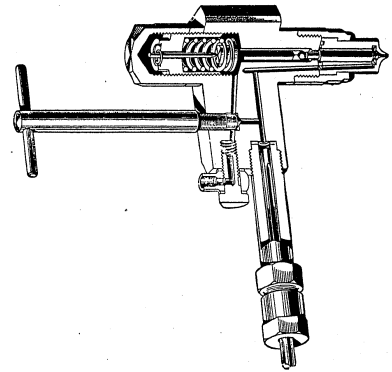


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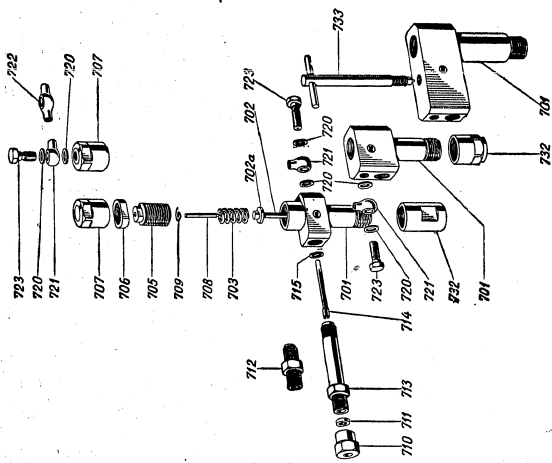


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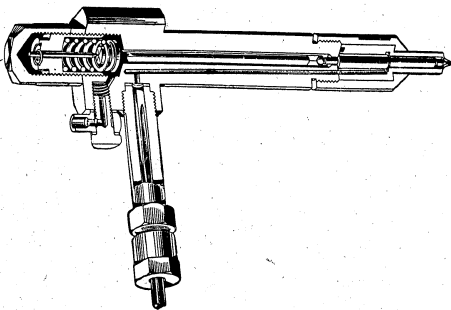


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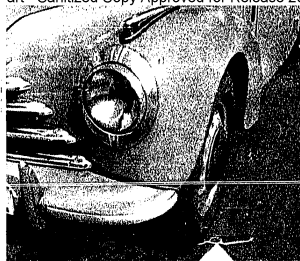
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1

X.

Your taste



Facts speak . . .

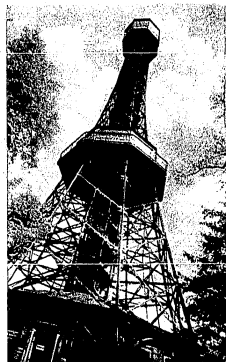
We have made several tests with the DOLONIT spectacle frames (unglazed) and here are the results:

We have run them over with a fully occupied motorcar — and have found them without damage.

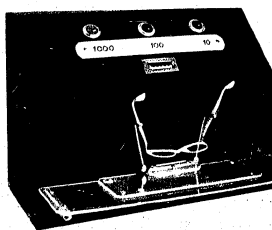


They fell 5 seconds

from a 60 meters (67 yards) high look-out tower — and came down sound and without the slightest damage.



Still not convincing enough



We continued and constructed a special device, by means of which the DOLONIT spectacles were constantly opened and closed. The result was that the DOLONIT spectacles after being opened and closed two million times, were found as sound and elastic as before the test. That means that in normal use the DOLONIT spectacle frames are everlasting.

OKULA

„dolonit“

is decisive. You may choose any shape of frame you please. A shape you just like, a shape you find fashionable, a shape which suits you. As a matter of fact, every face requires another style of spectacles. The DOLONIT spectacle frames accommodate. Year in, year out you can change the form of your DOLONIT spectacles — they take on any shape.

The DOLONIT spectacles are just what you like to have. And it's always the same pair of spectacles — the DOLONIT spectacles.



dolonit

dolonit

OKULA

dolonit

At last spectacles

you needn't take care of. Spectacles which stand everything. A splendid idea—you may say

a revolutionary novelty

in ophthalmic optics.

Spectacles always used to be a stumbling-block, especially on account of their most vulnerable part — the metal joint. Now this nuisance has been definitely abolished by the invention of the DOLONIT spectacle frames.

What is DOLONIT? A material of about the same qualities as nylon. DOLONIT SPECTACLES—spectacles that endure everything. Spectacles so flexible and elastic that they give the lenses a thorough protection against damage — the inevitable falls not excepting — not to speak of heavy wear. What's more, wearing DOLONIT you don't even feel you are wearing spectacles . . . so light are they. Spectacles which don't require any repairs. Spectacles, the shape of which you may change whenever you like. Sun goggles and spectacles for corrective lenses as well. Yes—the DOLONIT spectacles are like that. And mind, they aren't more expensive than ordinary ones.

You don't even feel

you are wearing spectacles - so light are they. Fifty percent lighter than ordinary spectacles — and that counts. Wearing DOLONIT, especially on sultry summer days, you will appreciate the delightful lightness.



Make a trial with ordinary spectacles

No spectacles in the world will stand anything like these do. You certainly know how little effort is necessary to cause damage to ordinary spectacles. Once it is a broken temple, another time a lost screw, once again a damaged frontpiece, above all — of course — a broken hinge. It is amazing that in most cases the lenses remain safe and sound whilst the frame goes to pieces. Just for this money saving quality it pays to buy DOLONIT, as they don't require any repairs. They are, consequently, cheaper than any other spectacles.



LIGNA POROUS WOOD-FIBRE INSULATING BOARD

IS ONE OF THE NEW IMPROVED
MATERIALS

It has a rough surface to which plaster can be easily applied
it deadens noise and vibrations.

Its insulating capacity is superior to that of other ma-
terials — for instance, it is 5 times greater than that
of coniferous wood, 23 times greater than that of bricks
and nearly 40 times greater than that of concrete.

Main characteristics:

Weight	kg/m ³
Deflection under load	kg/m ²
Water absorption — 2 hours	%
Thermal conductivity	Kcal/m ² /m/H ho
Moisture content after production	%

The board is produced in size 4' x 8' — thickness 1/2"

FOR SAMPLES
AND QUOTATIONS PLEASE COMMUNICATE WITH OUR
REPRESENTATIVE OR DIRECTLY WITH

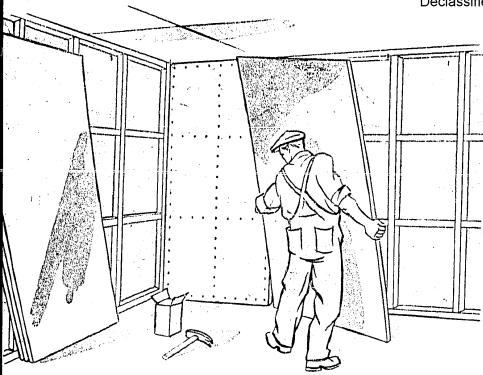


EXPORT AND IMPORT OF TIMBER AND PRODUCTS
OF THE WOODWORKING INDUSTRIES.
41, VODIČKOVA, PRAHA II, CZECHOSLOVAKIA.



LIGNA

POROUS WOOD- FIBRE INSULATING BOARDS



Architectural developments bring changes in building practice. For example, "skeleton" constructions are increasingly used and methods of eliminating "wet" work and of speeding up working processes are constantly being sought. Proper insulation is indispensable under modern conditions.

New methods require new materials and of these



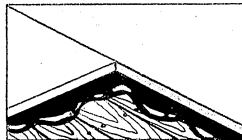
LIGNA POROUS WOOD-FIBRE INSULATING BOARDS

are among the best. They are light-weight building boards manufactured from coniferous wood. The interlocked fibres are produced by a process similar to that employed in paper-making, i. e. defibration, the resultant substance being formed into boards on a paper-making machine and then kiln-dried. The homogeneous structure is the result of lateral dispersal of the wood fibres. Some characteristics of natural wood tend to disappear and many of its defects are greatly reduced.

EASY WORKING — SPEEDY FINISHING

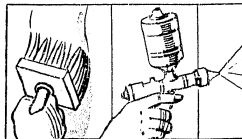
LIGNA POROUS BOARDS can be worked by the tools and machines used for any kind of timber. Their light weight, flexibility and convenient size allow of speedy fixing.

LIGNA POROUS BOARDS can be bonded together or to other materials.



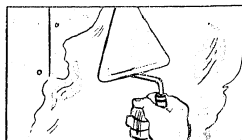
LIGNA

LIGNA POROUS BOARDS can be impregnated against fire, and dry rot, chemically treated and stained.



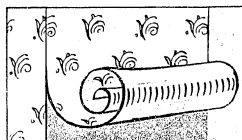
LIGNA

LIGNA POROUS BOARDS can be plastered.



LIGNA

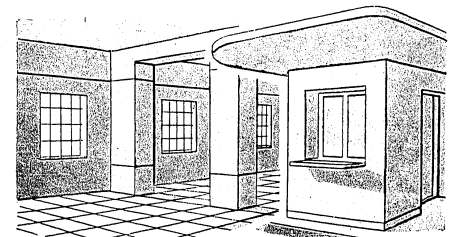
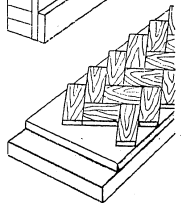
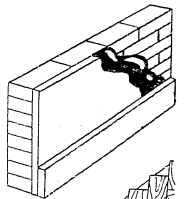
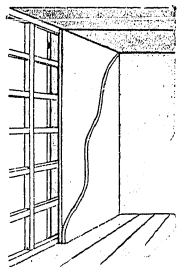
LIGNA POROUS BOARDS can be wallpapered.



EFFICIENT INSULATION MAKES FOR BETTER HEALTH AND COMFORT

LIGNA POROUS BOARDS provide the ideal insulation against heat and sound, in private houses, public and industrial buildings. Some of their many uses are: partitions, panelling, casing, wainscoting. They can be used in conjunction with or as a substitute for timber, woodconcrete, cork and its agglomerates, strawboards, composition boards, glass wool, bricks, concrete, etc

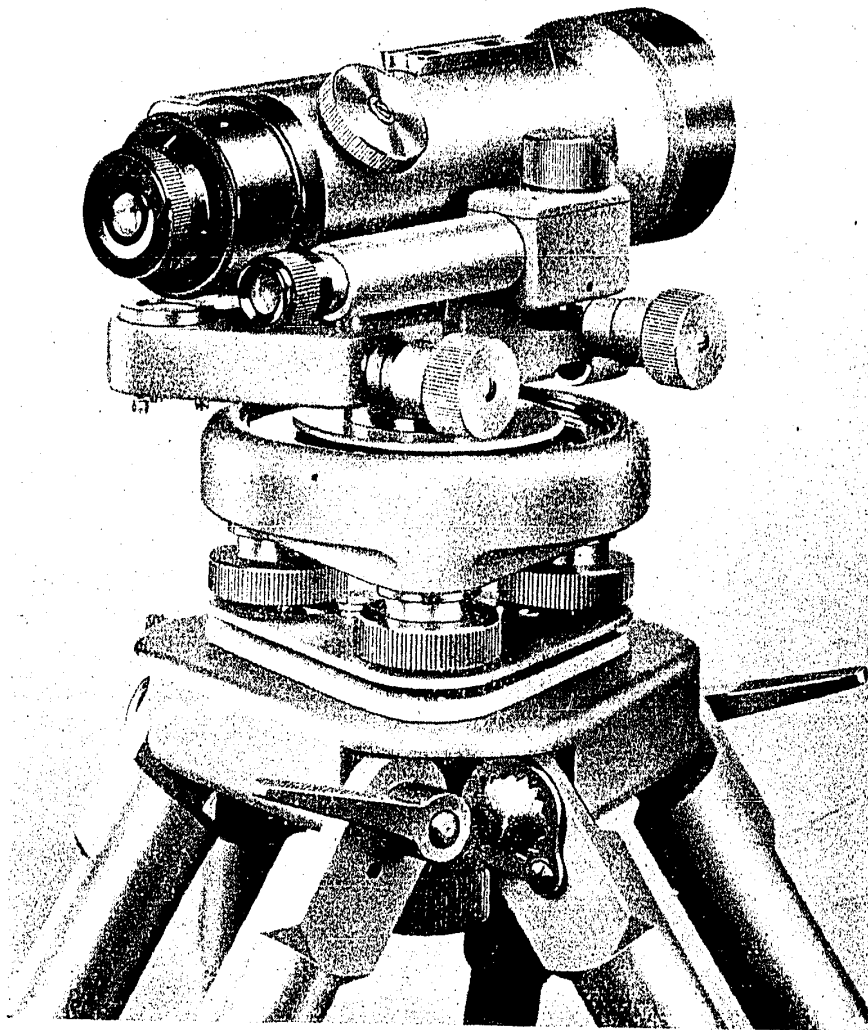
Fixing is simple, by ordinary methods.



meopta

22

MEOPTA NK 30x SURVEYOR'S LEVEL



APPLICATION

This instrument is suitable for accurate levelling of the second and third order of precision, for ordinary tachymetry, for use in constructional work of high precision (railways, tunnels, bridges), for measuring deformations (settling of dam walls), for installation of turbines, generators, large machines, etc.

DESCRIPTION

The telescope is analytic and is of 170 mm constant length. It is provided with internal focusing device and is proofed against dust and moisture. The cross lines are focused by moving the eyepiece which is fitted on its periphery with a diopter scale, in or out. The telescope is focused on the object by a knob located on the right-hand side of the telescope.

The telescope bubble tube is housed in the telescope body on the left-hand side. The bubble tube is read off on the coincidence principle directly in the telescope eyepiece. For illuminating the bubble there is a swivelling metallic mirror which is polished on one side and mat on the other side.

The vertical adjustment of the telescope is controlled by a fine micrometric screw located horizontally under the eyepiece in the telescope support. The screw is dust and moisture proof.

The horizontal circle is made of glass and mounted in the upper part of the circular levelling head. The circle is read off by a microscope attached to the telescope support.

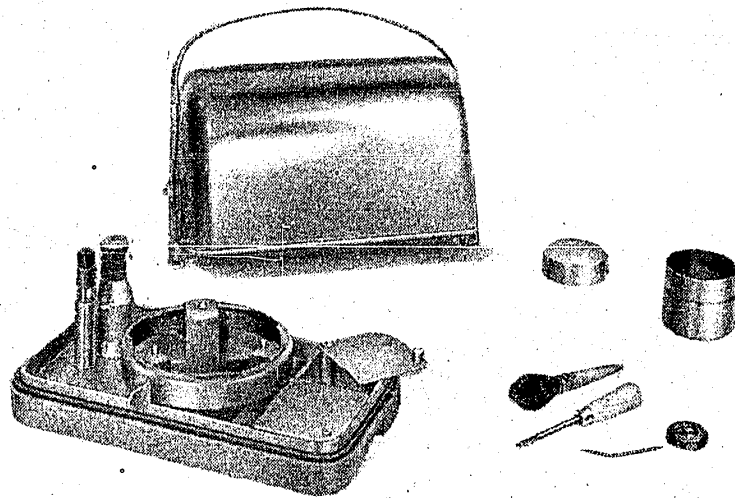
Horizontal adjustment of the telescope. The rough adjustment screw serves for rough adjustment and the fine adjustment screw for fine adjustment of the telescope.

The levelling head is so designed that the levelling screws can be operated even with gloves on. The levelling screws are dust and moisture proof. The elastic plate enables the instrument to be fixed firmly and at the same time elastically to the tripod head by the middle screw. The foot plate (the lowest part of the instrument) moves on the tripod head when centering the instrument.

Accessories:

Sunshade, adjusting pin, cleaning cloth, screwdriver, plummet of 250 grams, dust brush and yellow-green filter on the telescope eyepiece.

The instrument with accessories is supplied in a metallic case. It is advantageous to use a light and stable tripod stand with the instrument.



ADVANTAGES

Precise workmanship ensures constant accuracy of measurement. All micrometric screws, i. e. fine horizontal adjustment screw, elevating screw (vertical adjustment of the telescope) and the knob for internal focusing are located on the right-hand side of the telescope. The levelling staff and the bubble coincidence are seen directly in the telescope when levelling.

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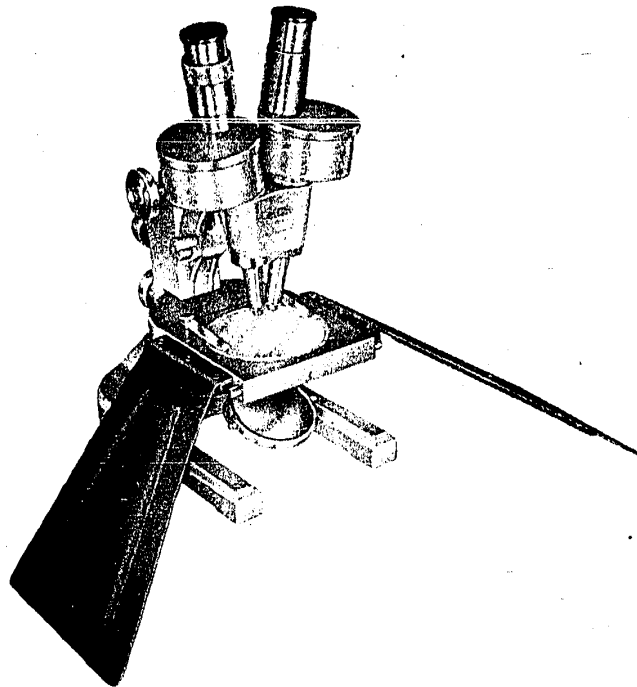
23

meopta

MICROSCOPE STEREOSCOPIQUE MEOPTA

G 11 P 563 01

système Greenough



EMPLOI

Le microscope stéréoscopique MEOPTA G 11 P est conçu à l'usage de laboratoires de sciences naturelles et de laboratoires industriels pour l'observation en relief d'objets éclairés par transparence ou par des rayons incidents. Selon les besoins, il est employé avec avantage à l'observation de préparations, au contrôle des états de surface des matériaux ou à d'autres usages analogues.

DESCRIPTION

En principe, cet instrument stéréoscopique est constitué par deux microscopes solidaires l'un de l'autre conçus pour l'observation sous un axe droit, inclinés l'un par rapport à l'autre sous 15° environ. Ils possèdent un statif inclinable, un miroir d'éclairage et une platine centrable communs. Les deux microscopes sont pourvus d'un système de prismes qui redresse l'image. L'objet observé apparaît donc droit et son image n'est pas renversée comme celle fournie par les microscopes ordinaires. L'objet est simultanément observé de deux points différents (observation binoculaire), mais chaque œil le voit à travers son propre microscope. L'image résultante est par suite stéréoscopique. Pour des raisons d'ordre optique, le microscope stéréoscopique ne peut être utilisé que pour des grossissements relativement restreints, jusqu'à $200\times$ environ, mais l'ouverture numérique des objectifs de grande distance focale et d'une grande netteté en profondeur étant petite, le grossissement maximum utilisable au point de vue optique de cet instrument est de l'ordre de $100\times$ seulement.

Le statif du microscope est formé par un axe inclinable recevant une platine amovible et un support de la tête stéréoscopique. La platine ainsi que le support

peuvent, indépendamment l'un de l'autre, coulisser en hauteur le long de cet axe et tourner horizontalement autour de lui. Leur coulissement vertical et leur rotation horizontale peuvent être arrêtés en tout point. La platine est percée d'un trou circulaire pour l'application de lames de verre porte-objet échangeables; en outre, elle est munie, de part et d'autre, d'attaches permettant d'assujettir des appuis pour les mains de l'observateur. La préparation est maintenue par une paire de valets amovibles.

Le miroir d'éclairage plan-concave est fixé à un bras à basculement latéral prévu au-dessous du plateau de la platine. On peut donc basculer et orienter le miroir selon les besoins pour éclairer l'objet sous l'angle voulu.

La tête stéréoscopique est assujettie à un bras articulé de son support. Ce bras, avec la tête, coulisse verticalement en vue de la mise au point de l'image. La commande de ce mouvement est assurée par un pignon et sa souplesse est réglable par rotation simultanée en sens inverse des molettes de mise au point.

La tête stéréoscopique (microscope proprement dit) est inclinable et amovible avec son support. Le corps du microscope, constitué par un tube double, est pourvu, dans sa partie supérieure, de deux boîtes à prisme avec tubes oculaires droits. Le tube oculaire gauche est fixe, le tube droit permet de corriger la différence dioptrique des yeux. La distance pupillaire de l'observateur est réglable par rotation des boîtes à prisme. La partie inférieure du tube du microscope comporte une queue d'aronde conçue pour l'application d'objectifs doubles échangeables.

L'instrument est livré dans un coffret portatif en bois dur poli, muni d'une poignée et d'une serrure.

AVANTAGES

Possibilité d'observer aussi bien dans le plan du pied du statif (après dépose de la platine) que dans toute position inclinée même jusqu'à l'horizontale. Instrument à usages multiples d'un maniement facile.

CARACTERISTIQUES

Équipement optique:

- objectifs achromatiques 1,8X, 3X, 5X, 10X (doubles)
- oculaires Huygens H 6X, H 10X,
sur demande paraplanaire
P 15X (toujours en paires)
- Porte-objet (2 pièces) Ø 80 mm, verre transparent et
laiteux
- Bras de statif inclinable à 50° environ
- Course de mise au point 50 mm
- Surface utile de la platine 100X100 mm
- Angle de rotation de la platine 360°
- Angle de rotation du support de la tête stéréo-
scopique 360°
- Angle d'inclinaison de la tête stéréoscopique 90° environ
- Distance pupillaire réglable entre 56 mm et 72 mm
- Mise au point dioptrique de l'oculaire ±5 D
- Miroir d'éclairage plan-concave, Ø 50 mm
- Grossissement total avec l'équipement optique
précisé ci-dessus de 12,8X à 100X (150X)

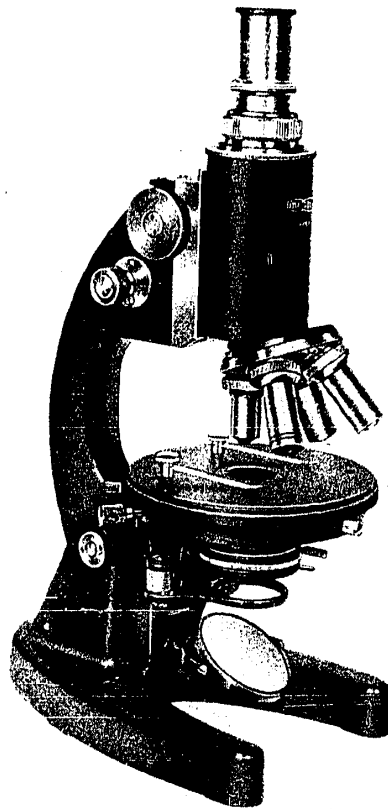
Désignation	Type	Dimensions mm			Poids kg	No de comm.	Prix
		largeur	hauteur	longueur			
Microscope stéréoscopique G11 P	MEOPTA 563 01	130	330	220			
Coffret		258	410	235			

24

meopta

MEOPTA A 23 V MICROSCOPE

Type 561 06



USE

The "MEOPTA" A 23 V Microscope with adjustable tube length is used for more complicated laboratory and diagnostic work which requires both a high magnification, a perfect illumination of the specimen and a centring movement of the stage.

DESCRIPTION

The instrument is equipped with a firm stand, the adjustable arm of which enables observation in an inclined position or - if required - photomicrographic work also in a horizontal position. The body tube of the microscope is 50 mm in diameter. The quadruple revolving nosepiece (for four object-glasses) is attached to the lower part of the body tube.

The medium type substage condenser unit comprises a condenser, an iris diaphragm and a hinged filter mount. The adjustment of the condenser is effected by rack and pinion. The plano-concave illuminating mirror is fixed in an adjustable mount.

The circular revolving centring stage is fitted with a removable circular diaphragm. The centring movement is actuated by two screws. The stage can be arrested in any position. The specimen is held by a pair of removable spring clips.

The adjustable eyepiece tube of the microscope is screwed on to the top part of the body tube. It is fitted with a numbered scale enabling the required tube length to be set accurately. The adjusted tube length can be arrested by turning the milled nut on the guide mount.

The focusing of the image is carried out by means of the coarse and the micrometer screw-type fine focusing adjustment. Free movement of the coarse focusing adjustment can be obtained by turning the two respective knobs in opposite directions.

The instrument is supplied in a polished hardwood transport cabinet fitted with a handle and a lock.

ADVANTAGES

Wide range of utilization. Easy operation requiring no special experience. Accurately adjustable tube length. The microscope can be supplemented by various additional accessories.

TECHNICAL DATA

Standard optical outfit:

Achromatic object-glasses	6×0.15, 20×0.45, 45×0.65, 100×1.25 oil im.
Huyghenian eyepiece	H 6×
Periplanatic eyepieces	P 10×, P 15×
Achromatic condenser	N. A. 1.2
Filter	cobalt
Tube length of the microscope	170 mm
Stand arm tiltable by	90°
Range of coarse focusing adjustment	50 mm
Range of micrometer screw-type fine focusing adjustment	2 mm
Accuracy of reading on the drum scale of the micrometer screw-type fine focusing adjustment	0.002 mm
Condenser mount	36.8 mm in diameter
Stage: circular centring revolving stage	120 mm in diameter
Range of centring movement of the stage	± 4 mm
Angle of revolving of the stage	360°
Total tube adjustment	33 mm
Range of adjustment of the adjustable tube lengths	from 158 mm to 191 mm
Illuminating mirror	plano-concave, 50 mm in diameter
Resulting magnification with standard optical outfit	from 36× up to 1500×

Suitable supplementary equipment:

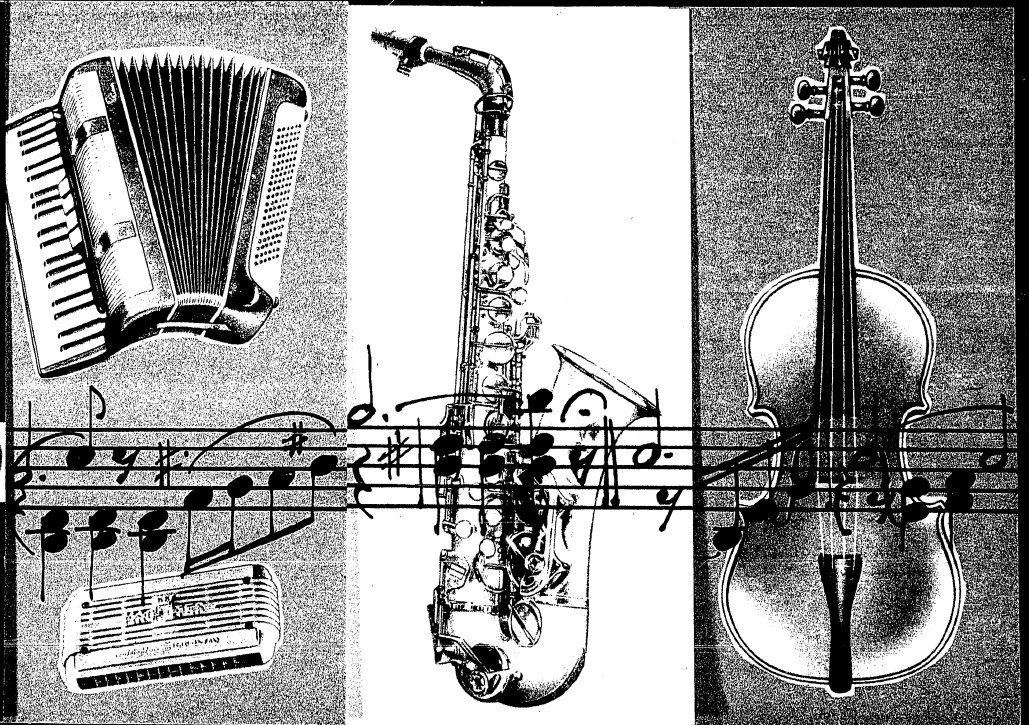
Mechanical slide carrier,
Paraboloid (dark field) condenser,
Camera Lucida,
Camera for photomicrography, etc.

Any required combination of optical outfit as listed in the Table "Optics for MEOPTA Microscopes" is available on special request.

... A SUPERB
PERFORMANCE WITH A
PERFECT INSTRUMENT

LIGNA

CZECHOSLOVAKIA





For 400 years Czechoslovakia, the traditional country of musicians, has been known as a country of perfect musical instruments.

Just say Schönbach or Kraslice — and it reminds musicians all over the world of first class instruments, excellent design and perfect tone.

ACCORDIONS AND HARMONICAS

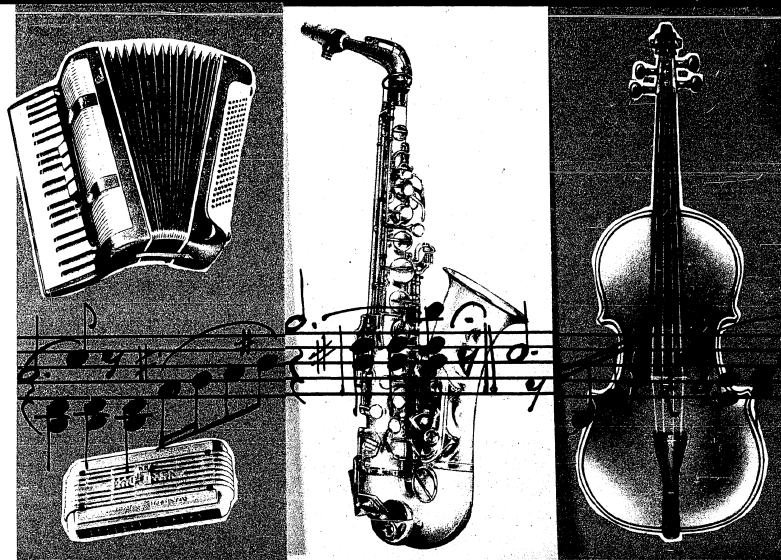
**MUSIC FOR YOUR
HEART'S DELIGHT . .**

Perfect Tuning — Flawless Workmanship

Czechoslovak harmonicas have a melodious, rich tone, modern design, small weight and perfect workmanship.

- Chromatic Accordions
- Small Piano Accordions for Youngsters
- Single- or Double- row Accordions
- Helicon Accordions

Small instruments which give a lot of pleasure — these are our high quality harmonicas, produced in many types.



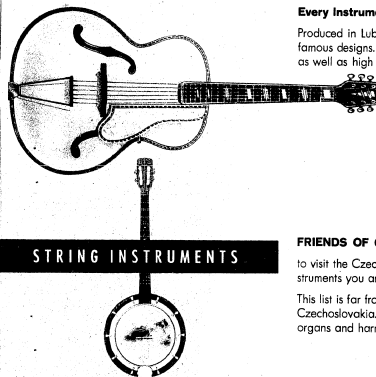
PIANOS



Trade-marks of world-wide reputation famous all over the world

Upright and Grand Pianos of famous makes – Petrof, Roesler, Weinbach, Scholze, August Foerster, Czechoslovakia. Precise intonation, flawless workmanship, perfect resonance, specific quality of the sound board. Beautiful, characteristic tone satisfactory even to the most exacting player.

These are the results of scientific experience and research coupled with the high artistic qualification and skill of the producers.



STRING INSTRUMENTS

Every instrument the Product of a Master

Produced in Luby-Schönbach by skillful violin makers according to world-famous designs. Instruments of rich, sweet tone and beautiful sound in low as well as high positions.

- Violins of all types and makes
- Violoncellos
- Contrabasses
- Guitars
- Mandolines
- Balalaikas
- Ukuleles
- Banjos

FRIENDS OF GOOD MUSIC – YOU ARE INVITED

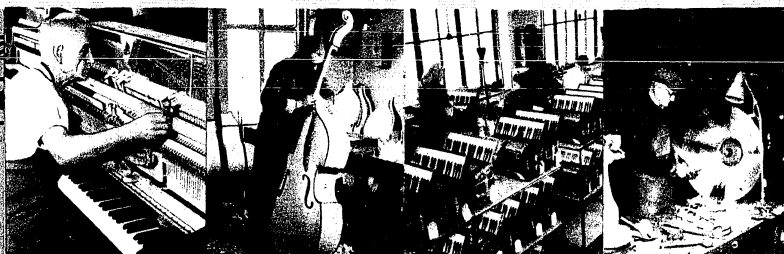
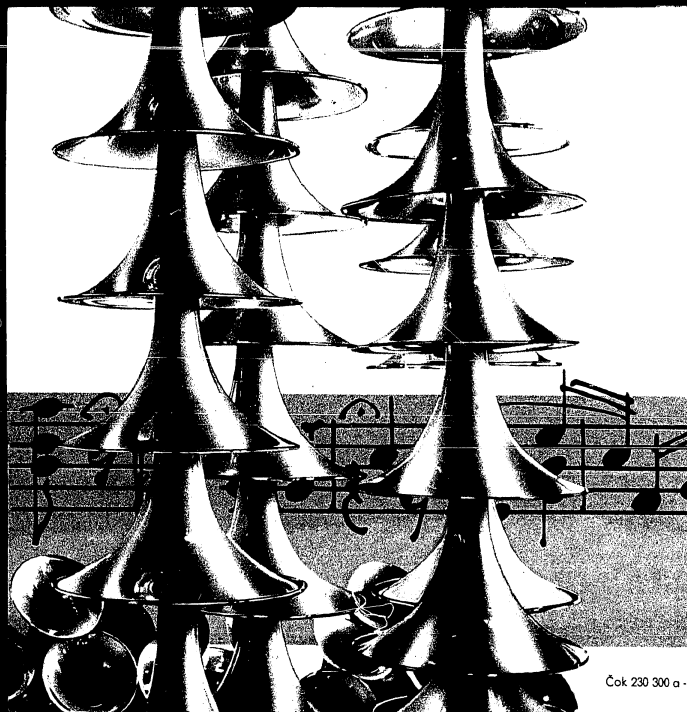
to visit the Czechoslovak Exposition of Musical Instruments. See those instruments you are interested in – convince yourself of their qualities.

This list is far from a complete list of the musical instruments produced in Czechoslovakia. There are also special instruments made for jazz orchestras, organs and harmoniums for schools, churches etc.



**Dealers – Ask for detailed Catalogues. Further information
about individual instruments will gladly be given by the
Representative:**

Foreign Trade Corporation - P.O. Box 667 - Praha II - Czechoslovakia

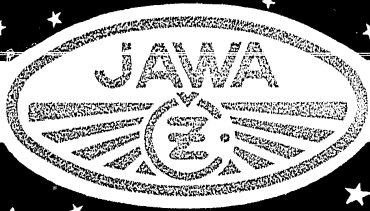


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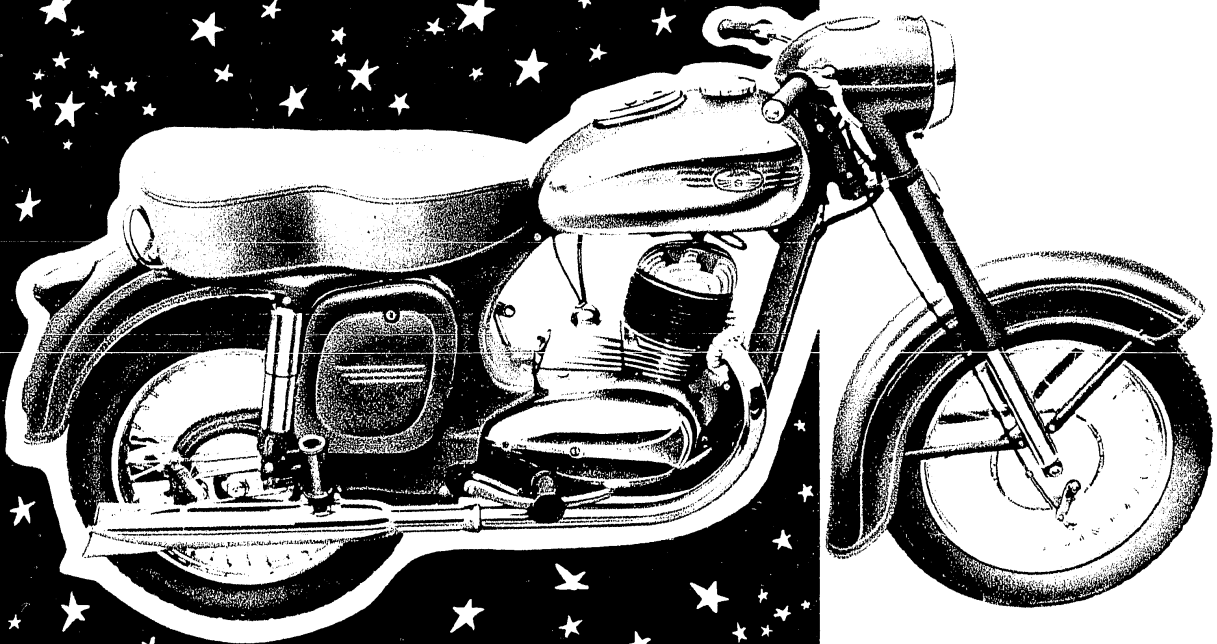
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250



THE STAR OF ALL MOTORCYCLES

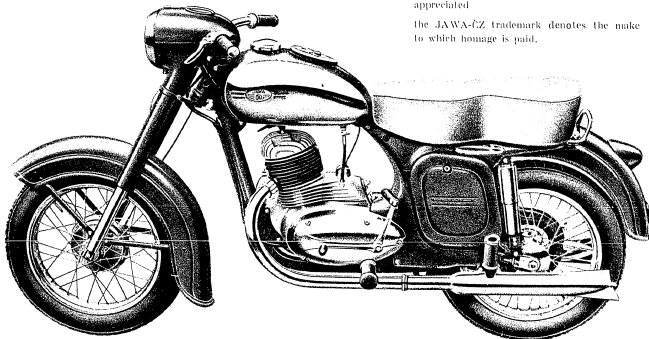


Wherever a word of motorcycles is spoken

Wherever races and trials are held

Wherever high reliability and perfect service are appreciated

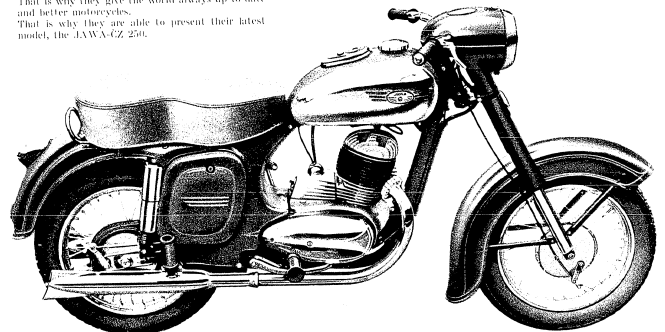
the JAWA-CZ trademark denotes the make to which homage is paid.



JAWA KNOWS THE WHOLE WORLD • THE WHOLE WORLD KNOWS JAWA

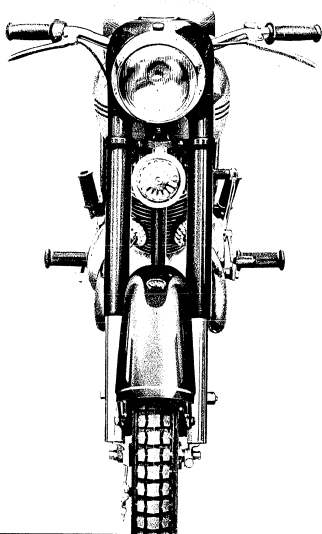
DUE TO ITS APPEARANCE AND PERFORMANCE - THE WORLD'S BEST TWO-STROKE

JAWA-CZ continuously widen the limits of their possibilities. That is why they go forward. That is why they give the world always up-to-date and better motorcycles. That is why they are able to present their latest model, the JAWA-CZ 250.



- Beautiful streamlining, until recently the privilege of motorcars, has been applied by the designers of this model with taste and grace.
- The fully enclosed rear part of the motorcycle and covered carburettor are of great practical value — you wash the machine with a jet of water in the same way as a car.
- The new graceful headlamp forming a part of the fork and handlebars is a sample of the successful effort towards graceful lines and to improve every detail.

SMOOTH START - LOVELY RIDE - SURE FINISH WITH THE JAWA-CZ



High performance — low consumption

This is the typical feature of the JAWA-CZ machines which for tens of thousands satisfied owners means miles calculated in pennies.

Automatic clutch control

This has been patented in all parts of the world. It means that you use the clutch only for starting from standstill — then you do not know it is there at all.

New improved suspension

The telescopic front fork with hydraulic damping and pivoted rear fork, also with hydraulic dampers, are equal to every unevenness of the ground surface — they transform a bad road in a highway.

Comfortable dual seat

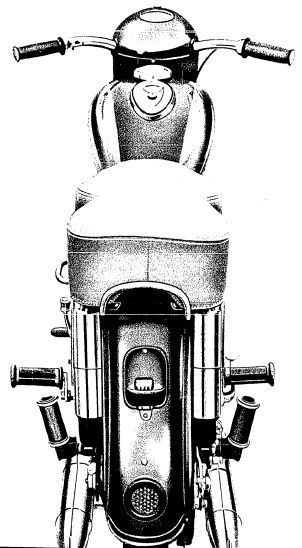
Its design, springing and foam rubber offer the maximum comfort and freshness even on long trips.

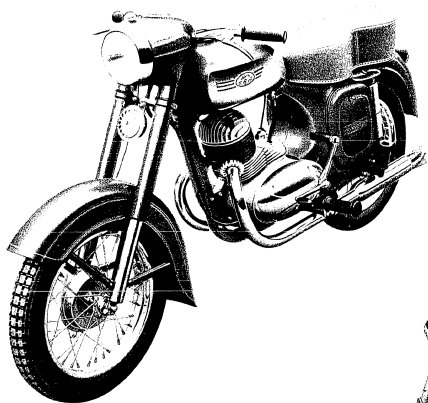
Deeply balanced mudguards

These give you protection from water and mud and offer you pleasant riding without the necessity of special clothing.

Small size wheels

These are half way between the wheels of a scooter and the wheels of a sports motorcycle. They reduce the unsprung weight and are thus one more improvement in the springing of the machine.





Simplicity

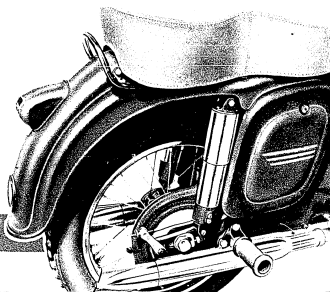
... this is the feeling everybody gains after only a few miles on a JAWA-CZ. Small weight, low centre of gravity, comfortable arrangement of all controls - even a beginner soon becomes an expert.

The economy

of the JAWA-CZ means that it stands any exertion, requires minimum servicing and saves its owner expense with regard to running and maintenance costs.

In sporting events

as well as on daily trips the JAWA-CZ will become your best friend.



FACTS TELL AND CONVINC

Of all the successes of the JAWA-CZ in recent races and trials we mention above all the International Six Days' Trial, the unofficial world championship. — This is how the JAWA-CZ machines proved themselves:

1951: The Dutch team on JAWA 250 machines won the Silver Vase.

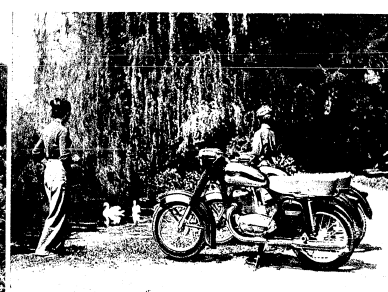
1952: JAWA-CZ machines won all the three premier awards: The International Trophy, the Silver Vase and the Manufacturers' Teams Prize.

1953: In the International Trophy Contest the JAWA-CZ machines were second with only one mark lost and they won the Silver Vase as well as the Gold Medal of the FIM in the Manufacturers' Teams Contest.

1954: A further big victory in the Six Days' Trial 1954 JAWA-CZ wins the International Trophy. One JAWA-CZ 150 in the "Silver Vase" victory team.

In the last eight "Internationals" JAWA-CZ won the International Trophy three times and the Silver Vase five times.

MENTION OF THE JAWA-CZ MEANS PRAISE



WELL PROVEN SUPERIORITY



WORLD FAMOUS MOTORCYCLE

Engine: Two stroke, single cylinder, bore 65 mm, stroke 75 mm, cylinder capacity 248,5 c. c., **12 B. H. P.** at 4250 r. p. m., compression ratio 6,25 : 1.

Engine lubrication: by petrol mixture at the rate of 25 : 1 (after running-in).

Clutch: Five plate with cork lining, running in oil bath, automatically controlled when changing gears or by means of hand lever on the L. H. side of the handlebars when starting from standstill.

Carburettor: JIKOV dia 24 (model 2924 H) with air cleaner and strangler.

Exhaust silencers: Perfectly silence the engine noise, two exhaust pipes with detachable silencers.

Gearbox: Four speeds, unit construction with the engine, positive foot control on the L. H. side and automatic clutch.

Electrical equipment: Coil type, dynamo 6 V/45 W, headlamp dia 150 mm with double filament bulb 6 V/25/25 W, 6 V—1,5 W, handlebar dipswitch. Combined tail and stop lamp 6 V—14 Ah battery. Switch box flush fitted in the fuel tank, containing an amperemeter and indicating the neutral gear position by means of lighting the tell tale bulb.

Fuel tank: Capacity 2,9 gallons (13 litres) with a two position fuel tap fitted with a filter. Emergency fuel reserve for 20 miles (30 km).

Transmission: By means of totally enclosed primary chain $\frac{3}{8} \times \frac{3}{8}$ in. running in oil bath and by means of fully enclosed secondary chain $\frac{1}{2} \times \frac{5}{16}$ in. in chaincase.

Frame: Closed, of best quality square section welded tubes with pivoted rear fork.

Suspension: Front — by means of telescopic fork with hydraulic dampers — maximum stroke $5\frac{1}{8}$ in. (130 mm).
Rear — by means of pivoted rear fork with hydraulic dampers — maximum stroke $3\frac{5}{16}$ in. (100 mm).

Handlebars: One piece adjustable, width $26\frac{3}{8}$ in. (670 mm).

Wheels: Tyre size 3,25 x 16 in., easily detachable.

Dual seat: With foam rubber, easily detachable, theft proof.

Footrests: Sports type, adjustable.

Other data: Weight	276 lbs (125 kg)
Carrying capacity	353 lbs (160 kg)
Maximum speed	62 m. p. h. (106 km p. h.)
Maximum climbing ability (fully laden)	40%
Fuel consumption at 30 m. p. h. (50 km p. h.)	93 m. p. g. (3 litres per 100 km)
Overall length	177,95 in. (1980 mm)
width	26,38 in. (670 mm)
height	40,35 in. (1025 mm)

location of design and equipment may be made without notice.

MOTOKOV
PRAHA-CZECHOSLOVAKIA

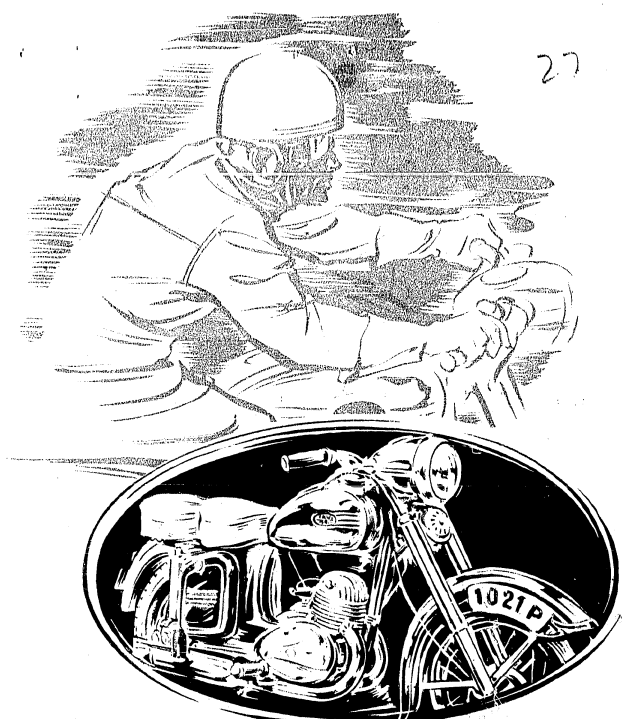
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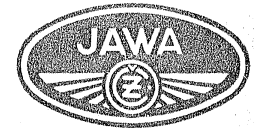
TECHNICAL DATA

	125 cc	150 cc
Engine	Two stroke	
Number of cylinders	1	1
Bore	∅ 52 mm	∅ 57 mm
Stroke	58 mm	
Cylinder capacity	123.2 c. c.	148.3 c. c.
Compression ratio	7 to 1	6.9 to 1
Engine output	6 BHP	7.5 BHP
Fuel tank capacity	2.9 gallons (13 litres)	
Fuel consumption at cruising speed of 30 m. p. h. (50 km. p. h.)	140 m. p. g. (50 km. p. l.)	125 m. p. g. (45 km. p. l.)
Maximum climbing ability of fully loaded machine	31%	
Weight (dry)	220 lbs (100 kg)	
Primary drive	By FAVORIT $\frac{3}{8} \times \frac{3}{8}$ in. chain, 50 links	
Final drive	By FAVORIT $\frac{1}{2} \times \frac{1}{16}$ in. chain, 114 links	
Primary and final drive ratios:	Primary	2.666 to 1
	Final	2.588 to 1 2.20 to 1
Overall gear ratios:	First	21.462 18.246
	Second	10.11 8.590
	Top	7.278 6.182
Internal expanding brakes	140 mm dia./25 mm width	
Braking distance from 30 m. p. h. (50 km. p. h.) (applying both brakes)	49 ft. (15.00 m)	
Full front fork suspension stroke	128 mm	
Full stroke of pivoted rear fork suspension	100 mm	
Carburettor	JIKOV 2918 HC	
Wheels: Rim dimensions	front	1.60 × 16 (2 $\frac{1}{4}$ × 16 in.)
	rear	1.85B × 16 (2 $\frac{1}{2}$ × 16 in.)
Tyre size	front	3.00 × 16 in.
	rear	3.00 × 16 in. 3.25 × 16 in.
		Speed about 60 MPH.



**NEW MODEL
NEW SUCCESS
NEW SERVICE TO MOTOR CYCLISTS**

MOTOKOV PRAHA • CZECHOSLOVAKIA



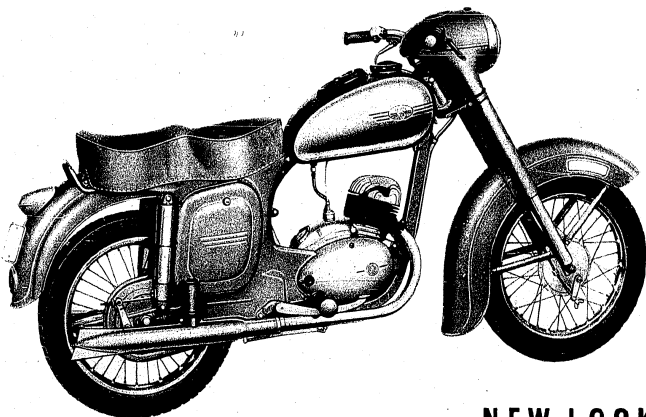
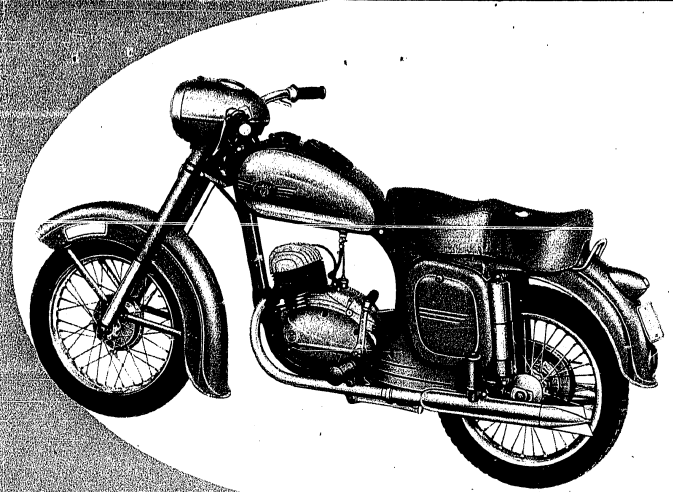
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Printed in Czechoslovakia

The Jawa and CZ motorcycles have the reputation of the world's best two stroke.

The Jawa and CZ Works have now developed in close cooperation new 125 and 150 c.c. models representing the outcome of their concentrated wealth of experience; a number of remarkable improvements bear witness of their combined endeavour.

The Jawa-CZ 125 and 150 Models are therefore a new creation of the two factories, the result of a purposeful effort of the designers and craftsmen — both well experienced in motor cycling.



These are the ten most important improvements:

1. Increased engine output
2. Hydraulically damped telescopic front fork
3. Pivoted fork rear suspension
4. Fully shielded cycle rear part
5. Fully enclosed driving chain guard
6. Extremely comfortable, foam rubber upholstered dual seat
7. Deeply valanced mudguards, more spacious tool box compartment
8. New headlamp of smart appearance, integral with front fork and handlebars
9. Small size wheels of 3.00×16 in.
10. Lower center of gravity, superb road holding, outstanding handling

NEW LOOK - WELL KNOWN QUALITY

31



OP 8x30

with central focusing screw



OP 8x30**with central focusing screw**

Type No	Magnification	Objective Ø mm	Exit pupil Ø mm	Light-transmitting power	Field of view		Weight grams	Weight of case grams	Codeword
					angle	m at 1000 m			
11254	8x	30	3,75	14,1	8°30'	150	515	225	MARCENT

A special construction enables you to see a wide field, which is equal to the field of view of our binocular 6 X 30.

The light-transmitting power is sufficiently chosen, so that the image is very bright at daylight.

It is used for travelling, nature study, sports events, and for all purposes where near and far objects are to be observed by turns.

KOVO *limited*

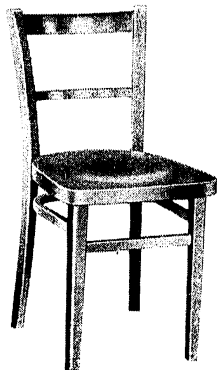
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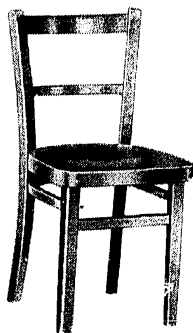
CHILDREN'S FURNITURE

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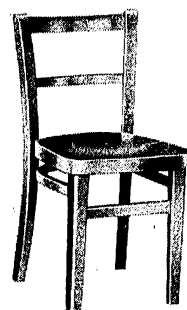
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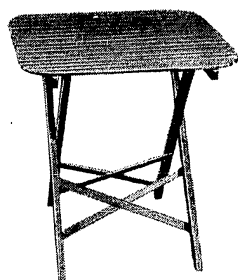
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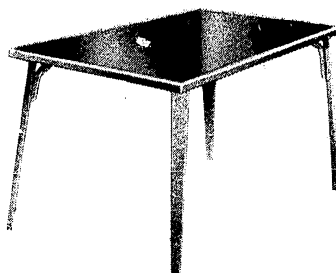
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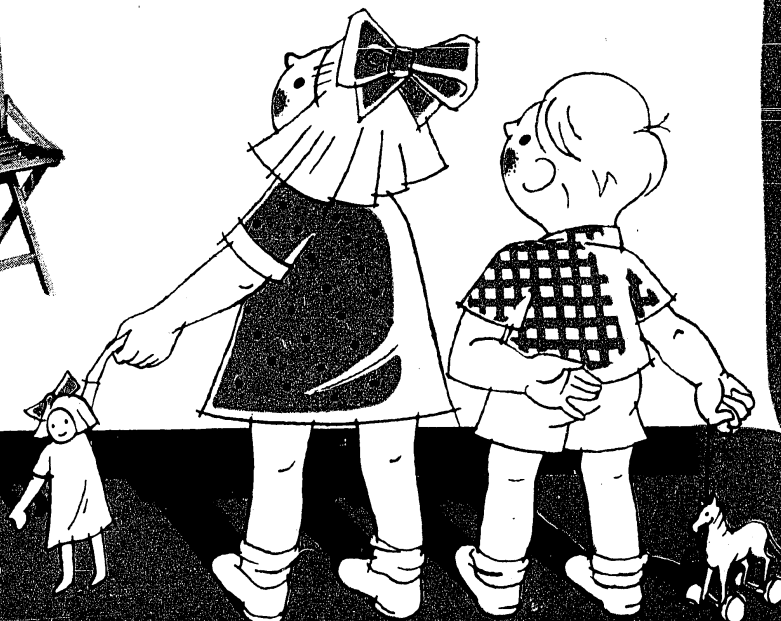
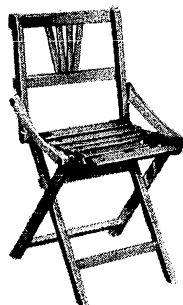
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