

The invention refers up
Ball joint switch, their shift lever in several
even one tiltable and in a position
by a latch plate can be recognized.
The ball joint switch is in particular
at radial drills or other multi-engine machines applicably.
With these machines the switch serves to the mono lever controller of several
engines.
It is actually desired, the shift lever
the ball joint switch easily of the one
to be able to move into the other position, over
To make changes of circuit fast and without energy expenditure. Therefore
one has those
Central position as well as every other position of the
Shift lever rests, around a step up
shift lever after overcoming, that
Slot feather/spring too, make possible.
Resting the switch could not
prevent that by an inadvertent movement of the shift lever of one of the
engines
coincidentally one switched on. Particularly easily
the possibility exists that the worker
when being busy at the machine through
Get stuck its clothes at the shift lever this pulls downward and thus with
radial drills the arm to downward travel switches. Thereby the worker can
come into danger, to the least however
the piece of work and/or tool can be destroyed, there the stroke of the
arm
substantially faster takes place than the feed motion
the drilling spindle when boring. The same conditions
are present, if by the ball joint switch for example the normal feed motion
or rapid traverse or however the horizontal and vertical feed motion
are switched.

In each of these cases one must be on it mindfully, those for the machine
and/or the piece of work or for the worker sometimes dangerously becoming
movement
to be able to switch on not inadvertently, without making however switching
on of the others on, to mostly more frequently occurring movements more
difficult.

After the invention this takes place by means of the fact that of
Hand opening latch plate under effect of a feather/spring in
the switching off central position of the shift lever in
a recess breaks in and the movement of the
Shift lever in the level, during he closes in
its locking position the movement of the
Shift lever in the other switching level leaves free.

In certain cases it can be favorable, if that

Latch plate beside also the other switching level in the central position of the shift lever closes, so that it when out moving from its central position in everyone Case to be unlocked must. The latch plate of the Shift lever can also of the one on the others cross slits switchable its. Thus it is possible, the shift lever depending upon the requirements in the one to be able to lock or other swiveling level.

The invention is in example-wise execution forms in the design represented, fig. 1 shows those Control device of a radial drill, fig. 2 a profile of the cross switch, fig. 3 one Plan view in fig. 2, fig. 4 and 5 different Positions of the switching club, fig. 6 and 7 the latch plate after fig. 4 and 5 in partial profile and opinion in two different positions, fig. 8 a cut by the latch plate after line A-A of fig. 7, fig. 9 one other execution form of the latch plate, fig. 10 one Plan view with cut of the latch plate after line B-B that Abb. 9.

The radial drill represented in fig. 1 is to Bohr-suffered with a cross switch 1 for control the lifting-motors and the drill-motors 3 provide 2. Becomes that Switching club 4 adjusts upward and/or down, then drives the arm upward and/or down. With the movement of the Switching club the drill-motor becomes to the right or left in one or more stages on pre or return a that Drilling spindle 5 switched.

In fig. 2 actually is a cross switch well-known design represented. In a ball grasp the ending Switching club 4 is by means of a ball 6 in Switch housing tiltable stored. To the education that Ball cup serves the front plate 7, by those Screws 8 is fastened. The contacts 9 sit at that Insulating clamp 10. The ball 6 possesses a reaming II, in which a pin 12 intervenes, in that Front plate 7 sits, also the cross slits 13 and 14 takes up. The switching club can in this way not around its axle to be turned. On that Switching club is the inside one the switch one Contact plate 15, those depending upon their swiveling position also the contacts 9 into contact comes. On the back the switch is a race plate 16, which those exhibits slots 17 and slots 18 at the inside the hollow ball surface are attached. The plate 16 is by means of the feathers/springs 19, which sit on the pin δ , flexibly stored. Into the slots 17 and slots 18 the race pin which is at pressure of the feather/spring \tilde{I} seizes

22. The feather/spring 1 presses the ball 6 into those
camp pan. In this execution are cross switches
already admits. In addition, the invention is at others
Cross switches as the described applicably.

In order to lock one switching level, possesses on that
Switching club from the outside on socket brought 23 to
lower end a latch plate flattened from both sides
24, that with the formed stage on the front plate 7
rests upon and in the cross slits of the other switching level
slides. The socket 23 serves to one as the admission
Compression spring 25, itself against the soil of the socket and
against the shank 26 on the switching club 4
screwed on ball grasp supports. The latch plate must
thus against the strength of the feather/spring 25 from that
cross slits to be pulled out, around the switching club
to be able to move into the other cross slits. Those
Socket 23 possesses a beginning 27, that as ball cap
or cone is trained and as if handles for pulling the latch plate out serves,
like it in fig. 2
is illustrated. The socket 23 possesses one
Longitudinal drilling, by which the bar 28 of the
Switching club passes through. Around the socket approximately
Twist to secure, can do these with a serration 29
provided its, into which in the bar 28
fastened pin 6 intervenes.

Also two can do over
90 to each other shifted slots 29 and 29' (fig. 8) arranged its, by the
latch plate 24 of the one to that
to be able to switch other cross slits. For this becomes
for example the knob partly unscrewed,
so that the stroke of the socket 23 more largely and a turn
thus the pin becomes possible for the socket around 90° into those
other serration to break in can. In this way can on
Place first the other switching level blocks
become.

In fig. 4 are different positions of the switching club
and the latch plate 24 posed. Of the central position
(fig. 4a) outgoing, the switching club from its can
rested position into the horizontal switching course I4
to the left (fig. 4b) and to the right (fig. 4c)
to be swivelled unhindered. . On the other hand is the way of
the central position (fig. 4d) in lower right
Switching course I3 locks, since the latch plate is broader 24
as this cross slits. Over into the positions in accordance with
Abb. 4e and 4f to arrive, are necessary it therefore, that
To pull latch plate 24 out of the cross slits I4.

In fig. 5 a similar switching sequence is posed. The latch plate 24 is from its central position in that cross slits I4 (fig. 5a) into the cross slits I3 (fig. 5b) switched. The upper and lower position in that vertical cross slits I3 (fig. 5c and 5d) knows now to be switched unhindered, on the other hand are those left and right position in the horizontal cross slits I4 locks. Therefore the latch plate 24 must out elevated become, around the positions in accordance with fig. 5e and 5f too reach.

In fig. 9 and 10 is a further execution form represented, with that the two switching courses I3 and I4 of the central position of the switching club out are at the same time locked. In this case those can Socket 23 at its lower end a cone-y form 31 exhibit, those into a circular recess 32 breaks in, which in the intersection of the two cross slits I3 and I4 is attached. It can do those Recess 32 are also omitted, if the dimensions it permit and the lock bush 23 directly in the intersection of the cross slits intervenes.

The bolting device is easily later on existing cross switches attachable.

Claims OF DE767337

PATENT CLAIMS: I. Ball joint switch, in particular for radial drills or other multi-engine Machines, its shift levers in several levels tiltable and in a position by a latch plate ascertainable it is characterized, by the fact that by hand opening latch plate under effect of a feather/spring in that switch that central position off of the shift lever into one Recess breaks in and the movement of the shift lever in the switching level, during he closes in its locking position the movement of the shift lever in leaves free to the more arid switching level.

2. Ball joint switch according to claim I, thereby marked that the latch plate in the central position the shift lever apart from the movement in the one also the movement in the other switching level closes.

3. Ball joint switch according to one of the claims I and 2, by the fact characterized that preferably in its horizontal switching level to -, around and elimination

an engine, for example the drill-motors, serving
Shift lever in its to -, around and elimination
the lifting-motors serving, preferably vertical
Switching level in its central position is locked.

4. Ball joint switch according to one of the claims I to 3,
by the fact characterized that one on the shift lever
axially mobile, not swivelling, a compression spring
containing socket at two against over-lying sides
it is in such a manner flattened that the flattening in one
cross slits slides, in addition the vertical direction
but than the other crosses slot is broader.

5. Ball joint switch according to one of the claims I to 4,
by the fact characterized that with a flattening
provided latch plates of the one on the others
cross slits switchable is

6. Ball joint switch according to one of the claims I to 5, by the fact
characterized that the socket with one, trained as latch plates
cap-shaped, itself the form of the ball grasp of the
Shift lever adapting handles is provided.

To the demarcation of the invention article of the conditions that
Technology are in the distribution procedure the following
Block letters considered: German
Patent specifications No. 654,375, 667,959, 68I 533, 7I 756;
USA. patent specifications NR. I 954,272, I II 828; British
Patent specification No. 332,974.