Development and Application of R pin insulator insulating rod with pincer

Ma Jun¹, Shi Yonggang¹, Dong Gang¹, Gong Fuxing¹, Wei Kegang¹, Su Xin¹, Ding Yu¹, Wang Zhu¹

¹ State Grid Tonghua Power Supply Compan, Tonghua, Jilin, 134000, China

Abstract. In the field of live working of transmission lines, the R pin insulator has been put into application as an emerging type of insulator connection in recent years. In view of the difficulty in eliminating the prior art and tools, and affected by the working environment, this scheme has designed a kind of R pin insulator insulating rod with pincer. The design scheme consists of a hook body and connecting members, an insulating operating rod, etc., and does not change the operation method of the original insulating rod for the pincer, and the hook head is horizontally moved by the rotation of the nut to achieve the loading and taking of the R type limiting pin. The deductor has a simple structure, is simple and flexible to operate, and is convenient to carry. The process of taking off the sales is less difficult, greatly shortening the time, improving the efficiency of the work, and achieving the purpose of optimizing the operation process. And it has a broad market prospects.

1. Introduction

In overhead transmission lines, insulators are susceptible to external environmental factors during long-term operation, resulting in flashover or breakdown. In addition, with the aging problem of the insulator itself, replacing old and zero-value insulators is the live working of the transmission line, one of the main work items[1-3]. The two suspension insulators are connected by the ball head with the bowl head, and the limit pin is inserted after the connection to achieve the locking effect. Under the prior art, the pins for limiting the insulator ball head mainly have a W-shaped limit pin and an R-type limit pin. The two limit pins function the same, but the direction of penetration is different. The penetration direction of the W-shaped limit pin is penetrated from the large mouth of the bowl head, and fixed outside the small mouth. The penetration direction of the R-shaped limit pin is penetrated from the small mouth, and the self-shape is used to achieve the jamming effect[4-7].

At present, W-type limit pins have been widely used in actual production, and some special tools such as pincers have been configured. However, in recent years, the R-type limit pin that has just been put into use has been used as an emerging limit component. The original W-pin type of live working insulation rod with a pin-out device cannot be used. Currently, the market is used for such limit pin work tools. Imperfect, only use tools such as pliers, wrenches, screwdrivers to hook, slap, pull out at the pin hole to take the pin, and affected by the working environment factors, the operation space is small, the withdrawal is extremely inconvenient and time-consuming, laborious and destructive. It is easy to damage the galvanized layer of the limit pin, shorten its service life, shorten the replacement cycle, increase the workload, and often cause hand bumps and scratches on the operator. In view of the existing situation, a pin puller for the R pin insulator insulating rod is invented for pulling and taking out the R type limit pin, and can be operated by the insulating rod to meet the need of the live replacement insulator.
2. Scheme design

The design of the invention is a R pin insulator insulating rod with pincer, the main body adopts an insulating rod, the rod has a section of the screw rod, the screw rod has a sliding thread nut, and the screw rod side has a silk mother chute connecting the silk mother, the hook. The head slide is vertically connected to the lower end of the silk guide. The hook head slide has a sliding hook head, and the hook head is connected to the nut by a wire rope, and a return spring is arranged at the rear end of the hook head.

In the design scheme, the upper end and the lower end of the silk slide are slewingly connected with the insulating rod, and the wire rope between the hook head and the nut connection is placed on the steering wheel at a right angle.

Embodiments of the present invention will be further described in detail below with reference to the accompanying drawings. The structure diagram of the pin puller for the R pin insulator insulation rod is shown in Figure 1. The structure of the hook head is shown in Figure 2.

Fig.1. Structure of the take-off device

Fig.2. Hook structure diagram
Referring to Figure 1 and Figure 2, the parts are as follows: 1-insulated rod, 2-screw, 3-silver, 4-wire female slide, 5-hook slide, 6-hook, 7-wire rope, 8-return spring, 9-steering wheel.

The method is as follows. The hook head is used to hook the round hole of the head of the R pin, and the front end of the hook head slides against the head of the insulator, and the screw rod of the head is rotated by rotating the insulating rod, thereby moving the nut and the nut is driven. The wire wire pulls the hook head to pull the R pin in the hook slide and achieve the purpose of pulling out the R pin. Finally the hook is reset by the return spring[8-10].

3. Application effect

The utility model provides a practical tool for electrically replacing the R pin insulator. The invention does not change the operation method of the unloading pin for the insulating rod of the original W pin insulator, and realizes horizontal movement of the hook head by rotating the insulating rod to achieve loading and taking R the purpose of the type limit pin[11-15]. The invention is simple and flexible in operation, and is convenient for the operator to quickly grasp the use mode, and the components are easy to disassemble, convenient to replace, convenient to carry, low in cost, and have market value. The tool has been tested to greatly improve the working efficiency and reduce the damage to the galvanized layer of the R-type limit pin. It can also be flexibly used in the case of small operating space, so that the transmission pin can be replaced when the transmission line is charged. The work of the insulator becomes safer and more convenient[16-17].

4. Conclusion

One of the most common defect treatments in high-voltage transmission lines is the replacement of insulators. The original method is adopted to install R-type limit pins, which has high labor intensity, low efficiency and high safety risk. The invention of the tool provides the possibility of replacing the R pin insulator in the non-equal potential operation mode, reduces the difficulty of maintenance of the insulator, is simple in operation, saves time and labor, effectively reduces the labor intensity of the worker, and saves the working time of the high-altitude live working, and guarantees the safety of the staff, improve work efficiency, and apply to market promotion.

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