To all whom it may concern:

Be it known that I, Samuel B. Willis, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Fire-Fighting Apparatus, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to provide a mechanism to support a fire hose at an elevation suitable for fighting fires, the nozzle of said hose being manipulated to play the water on the fire in simulation of manual manipulation; to provide a supporting mechanism of the character mentioned upon an extension ladder of conventional structure, with nozzle manipulating means operable from the foot of the ladder; and to provide a simplified and durable mechanism for accomplishing the above purposes.

One embodiment of the present invention is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a supporting and manipulating mechanism constructed and arranged in accordance with the present invention, the same being shown in conjunction with the upper end fragment of an extension ladder of conventional construction; Fig. 2 is a rear elevation of the same; Fig. 3 is a vertical section taken as on the line 3—3 in Fig. 1, the locking collar being shown in dotted lines in said figure, and the nozzle, gooseneck and fire-hose connected therewith being shown in full lines. Fig. 4 is a vertical section taken as on the line 4—4 in Fig. 1.

The ladder 9 shown in the drawings is of conventional construction, and provides between the top rungs 10 thereof spaces for securing the frame wherein the hose-carrying and manipulating truck is supported and guided. The frame referred to is provided with side bars 11, between which extend a guide rail 12 and a track rail 13, said rails being rigidly secured to said side bars. The side bars 11 and perforated to receive bolts 14, whereby the frame is rigidly mounted on the ladder 9. The rail 12 is a T-bar, and is provided with an extension plate 15, to operate as a guide for the end loops 16 of the supporting truck. The rail 13 is likewise T-shaped in cross section, and is provided with a gear toothed rack section 17, the teeth whereof are formed to mesh with the teeth of carrying wheels 18 supporting said truck.

The truck referred to consists primarily of a face plate 19, which extends between the loops 16, and is rigidly secured thereto by bolts 20, as seen best in Fig. 2 of the drawings. The face plate 19 is provided with a central opening 21, through which the nozzle of the hose is extended when in service. The wheels 18 are provided with suitable axles, bearings for which are formed in the loops 16. The truck thus united is drawn from side to side of the supporting frame by operating cables 22, the lower ends of which are preferably carried to the bottom of the ladder forming the support for said frame. The cables 22 are secured in eyelets formed in wings 23 extended from the sides of the plate 19. When the carriage is drawn by alternate pulls on the cables 22, from end to end of the frame, the wheels 18 revolve, all slippage thereof being eliminated by the engagement of the teeth 24 of said wheels with the teeth of the rack section 17. To guide the cables 22, suitable pulley blocks 25 are mounted on the ladder, as shown best in Fig. 2 of the drawings.

The fire hose 26 to be used in connection with the present invention is secured by a coupling 27 to a rigid goose-neck 28. The gooseneck 28, in service relation, is mounted, by means of a coupling 29, on a nozzle 30. The coupling 29 employed for this purpose is furnished with conventional spanner pins 31, which thereafter serve as pivots for the manipulation of the nozzle 30 and gooseneck 28, when resting in saddle brackets 32 set out from the face plate 19. The saddle brackets 32 and the plate 19 are reinforced by offset flanges 33, at the upper ends whereof are provided journals to receive pivot bolts 34, forming a pivot connection to swing a locking collar 35. The collar 35 is provided with suspension arms 36, through the ends whereof the pivot bolts 34 extend. The lower ends of the collar 35, in service, rest above the recesses in the saddle brackets 32 provided to receive and hold the pins 31. The collar 35 is normally held in service relation to the brackets 32 to hold the pins 31 in the seats provided therefor by the weight of said collar. When introducing the nozzle through the opening 21 in the face plate 19 to dispose the pins 31
in the seats formed in the saddle brackets 32, the collar 33 is lifted to rest above and upon the plate 15.

To support the forward end of the nozzle 30, an oval-shaped ring 37 is provided. The ring 37 is thus shaped to permit the same to be rocked by cranks 38 with which it is pivotally connected by short stud shafts 39.

To form said connection with the cranks 38, the ring 37 is provided at opposite ends thereof with lugs 40, the ends of which are perforated to receive the shafts 39, as seen best in Fig. 1 of the drawings.

The cranks 38 are fixedly mounted upon the axles of the wheels 18, to revolve therewith. The wheels 18, cranks 38 and rack sections 17 are so proportioned that when the wheels 18 are moved from end to end of said rack, the wheels are caused to perform one-half of a complete revolution, the cranks 38 performing also one-half of a complete revolution, lifting the ring 37 from the position shown by full lines in Fig. 4 of the drawings to the position shown by dotted lines in the same figure, with the effect upon the nozzle 30 that the same is rocked on the pins 31 to assume the extreme positions as shown by the full and dotted lines in Fig. 4 of the drawings. The dimensions indicated by the full-line position in Fig. 4 of the drawings provide a wide and suitable area of travel for the stream of water thrown from said nozzle when in service. The carriage and nozzle mounted thereon traveling lengthwise of the supporting frame on the rack section 17, and being coincidentally lifted and lowered, produces an area of play of the water thrown from said nozzle, thereby increasing the effective area of operation of the water by increasing the effective area of the hose play.

The ladder for which the apparatus is more particularly designed is that known as an extension ladder, commonly used by fire departments, and having a revolving base, whereby said ladder may be rotated or revolved about the center of said base. It will, however, be understood that the apparatus is adapted for service in connection with, and while mounted upon, other ladders than that of the character mentioned. When mounted on any form of ladder, the upper end of the ladder is disposed opposite some opening in a building and there remains while the fireman at the base of the ladder, by manipulating the cables 22, may shift the truck and nozzle carried thereby from side to side of the supporting frame, the delivery end of the nozzle being moved by the ring 37 to perform the arc above described, to increase the effective area of the stream emitted from said nozzle.

It will be understood that a ladder properly protected could be placed above an opening where it would be impossible for a fireman to operate because of the gushing smoke and flames therefrom. Also, it will be understood that where extension ladders are employed, such an apparatus as herein described enables the ladder to be lifted to a greater height, it being unnecessary to support the weight of one or more firemen at the upper end thereof. At the same time, the play of the nozzle can be controlled and directed by the swing of the ladder and the movement of the truck, by drawing upon the cables 22 with as much precision and effect as could be accomplished by a fireman on the ladder.

**Claims:**

1. An apparatus as characterized, comprising a track frame; a hose carrier truck operatively mounted, to oscillate, in said frame; means for holding a fire hose nozzle on said truck to move therewith; and means for oscillating the delivery end of said nozzle in a plane perpendicular to the plane of movement of said truck.

2. An apparatus as characterized, comprising a horizontally-disposed track frame; a wheel-supported hose carrier truck mounted to travel lengthwise on said frame; means for holding a fire hose nozzle on said truck to rock thereon; means for rolling said truck lengthwise said frame; and means for rocking said nozzle during the travel of said truck.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

**SAMUEL B. WILLIS.**

**Witnesses:**

E. F. MURDOCK,
PHILIP D. ROLLMANN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."