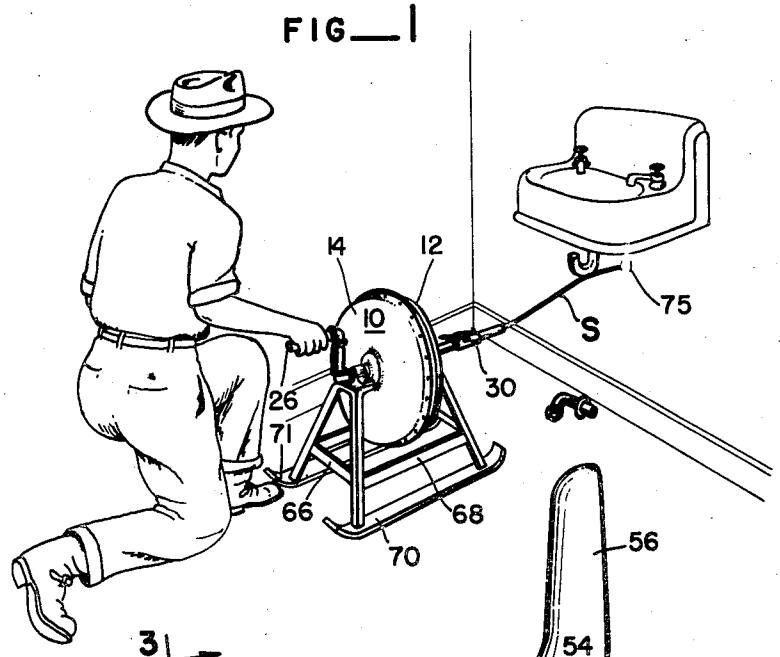
July 15, 1952 J. S. HERMANSON 2,603,495

DEVICE FOR CLAMPING PLUMBER'S SNAKES

Filed March 23, 1948 2 SHEETS--SHEET 1

FIG. 1



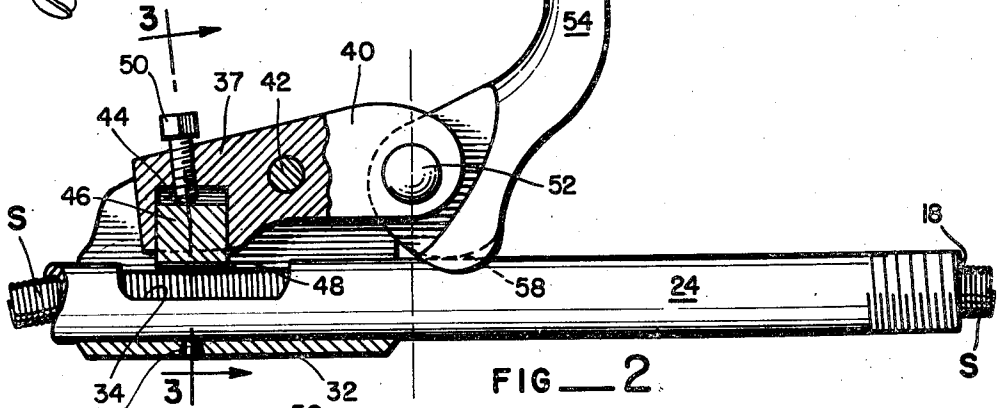


FIG. 2

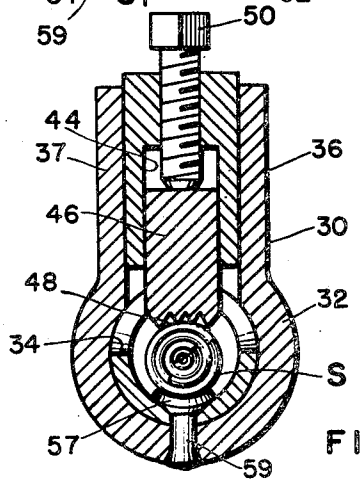


FIG. 3

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July 15, 1952 J. S. HERMANSON 2,603,495

DEVICE FOR CLAMPING PLUMBER'S SNAKES

Filed March 23, 1948 2 SHEETS—SHEET 2

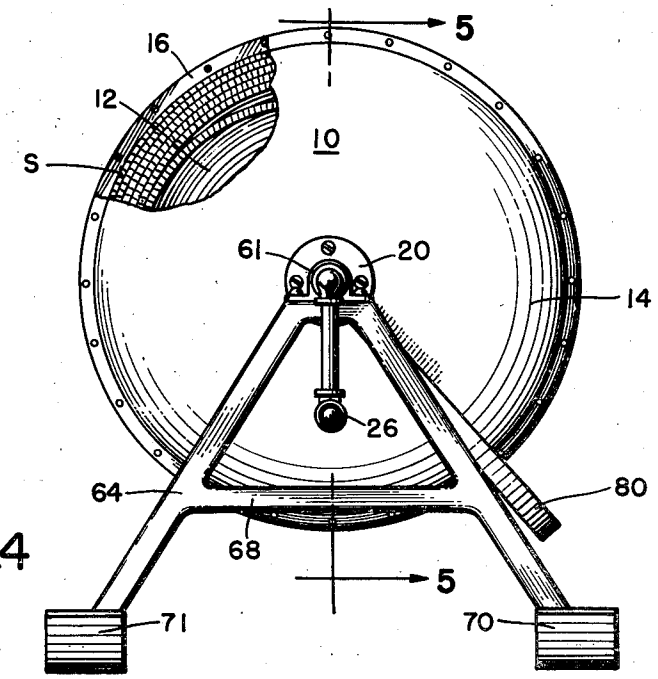


FIG. 4

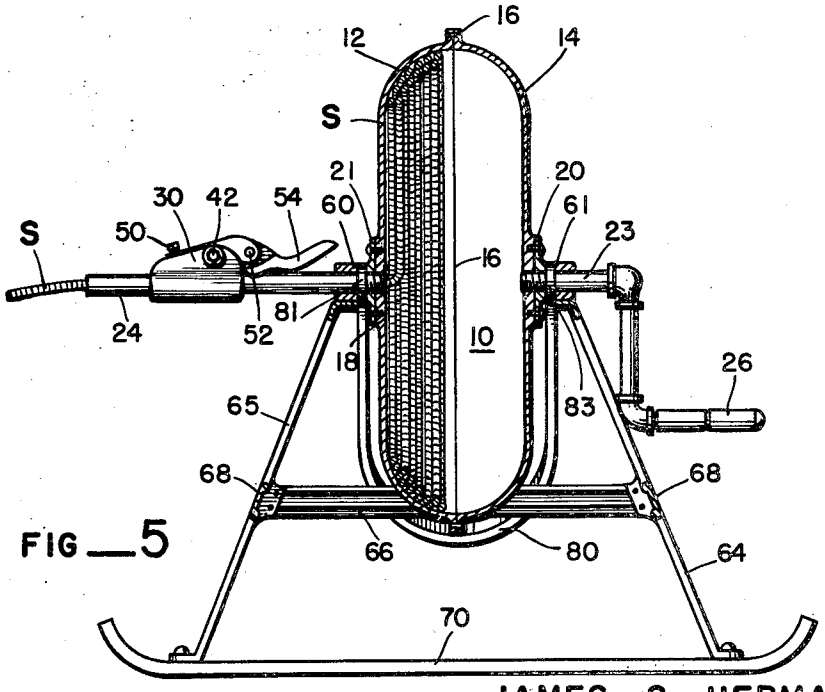


FIG. 5

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DEVICE FOR CLAMPING PLUMBERS' SNAKES

James S. Hermanson, Seattle, Wash.

Application March 23, 1948, Serial No. 16,494

1 Claim. (Cl. 279—44)

1

My present invention relates to the general art of plumbers tools and equipment, and more particularly, to device for clamping a plumber's snake.

Ever since the introduction of modern plumbing, there has always been a problem of keeping that plumbing free of obstructions, and the most convenient means that has been found to date is to employ what is generally referred to as a plumber's snake. This snake is made in such a manner that it provides a long run of flexible material that functions as a hose might, or as a flexible wire might in going around the various bends occurring in plumbing, and still have the power to revolve cutters, or to employ hooks or other devices that can be used for clearing out obstructions, beyond the normally occurring bends. The most satisfactory snakes of the present day use are those that are formed as long continuous coils of spring wire. The outside diameter of the snakes varies somewhat and may, for short runs, be as small as one-quarter or three-eighths of an inch; however, one-half inch, or slightly larger, is usually considered about the most satisfactory for extended use.

Many handles and other operative devices have been provided in the past to aid in the handling of these plumbers snakes. In some instances, they are merely a handle that grips the body of the snake, as with a set-screw or thumb-screw, or they may take on the form of a crank, or in a preferred form they may be after the form of a letter S, or be ogee in shape.

In use, it is very desirable that the snakes which themselves become soiled from use in sewers and the like, should not be so used as to disfigure or soil the floor or walls or furnishings of a home, for instance. Many ingenious arrangements have been provided to in some way wrap-up or protect the snake so that it cannot become a means for soiling materials when in use. Cloth or canvas shielding and covers have often been employed in the past. Due to the stiff and unwieldly nature of the snake itself, it has a tendency to "whip" or spread unsanitary sewage over a large area. Careful plumbers have tried to prevent this condition by laying down canvas covers and the like, but this has been very ineffectual, partly because the cover is used from job to job without cleaning and also because the cover is used only on the floor, thus leaving the walls exposed.

However, it must be understood that for real utility a plumber's snake often must be fifty to one hundred feet long and, especially when starting in to work on an obstruction, the exact condition of which is unknown, the operator has to contend with a large coil of the snake that is outside of the plumbing fittings. Further, it is very desirable that the snake can be revolved as it is forced into small pipes and the like, as it is much easier to propel the same through and around the fittings and the like, if a rotary motion can be given to it. This greatly complicates the use of the very long snake. However, in my present snake handling and housing arrangement, I believe I have overcome many of the deficiencies of this equipment as shown by past experience.

2

My device consists essentially of a housing member large enough so that it can house a coil of the plumber's snake of the desired length, and have this housing mounted in a revolvable manner so that, as the need for revolving the snake becomes necessary, the whole coil can be easily revolved as a unit. In order to obtain full use of my arrangement, I find it desirable to provide a clamp means so that the snake can be clamped to the housing generally, and that a crank handle be provided for revolving it. Further, I have provided means whereby my whole device is suitably mounted so that it can be slid to and fro around the axis of the pipe, so that the snake can be propelled inwardly or outwardly while still fixed by the clamp means to the housing.

The principal object of my present invention is to provide a revolvable housing for a plumber's snake.

A further object of my invention is to provide, in addition to a housing for a plumber's snake, means for clamping the snake in an operative position to the housing.

A further object of my invention is to provide means whereby my snake housing and clamping means can be effectively turned while in use.

A further object of my present invention is to provide, as a unitary structure, a snake housing and means for operating the snake, while the same is partially inserted in the plumbing and the balance of the cable or snake is in the housing, and to have the equipment so arranged that it can be moved as a unit, as in forcing a snake through a pipe or withdrawing the same where considerable force is required in the operation.

A further object of my present invention is to provide gripping means for a plumber's snake which employs an adjustable and interchangeable snake gripping member, to the end that a se-

cure and proper gripping of the snake may be achieved without damage to the same.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

In the drawings:

Fig. 1 is a perspective view showing my equipment as it appears when in use.

Fig. 2 is a vertical sectional view through the snake-gripping clamp mounted on my device.

Fig. 3 is a cross-sectional view of Fig. 2 taken along the line 3—3 of that figure.

Fig. 4 is an end view of my snake housing and its associated parts with a portion of the housing broken away to illustrate the manner in which the snake is stored within the housing.

Fig. 5 is an elevation with certain parts shown in section as would occur if a cutting plane were passed along the line 5—5 of the Fig. 4.

Referring more particularly to the disclosure in the drawings, the numeral 10 designates the central unit of my device which forms the snake housing. The preferred form of making this unit is to form it as two symmetrical halves as the saucer-like members 12 and 14. These are preferably secured together at their maximum periphery by the use of small machine screws or rivets. The two housing members 12 and 14 can be made in various ways, as by casting them of lighter weight metals or plastic, or by spinning them or by pressing them out of sheet metal stock. From the standpoint of utility, the housing should be constructed as lightly as possible of two halves of adequate strength to resist distortion, considering the rough use that equipment of this order must be designed to accept.

The cross-sectional form, as shown in Fig. 5, has been found to have many desirable characteristics, namely that a relatively large radius is employed in striking the curves for the inside of the housing members and, preferably, the curves as they join at point 16, complete a circle. When so arranged, there is a natural tendency for the snake S, being resilient and spring-like, to seek out the maximum diameter when entering the housing through a centrally disposed opening as 18, when the snake is brought more and more into the housing. This spring action tends to make the snake conform to a radius which is much greater than the radius of the housing members. The snake therefore tends to lie close to the shell and this makes for the most satisfactory stacking of the snake within the housing. In other words, it takes on the general principle of a coil of wire or a coil of rope, and as it is well known that a coil of rope pays out best from its center, so the same action is experienced with a snake. When the general proportions referred to are maintained, the equipment can be used over long periods without danger of any kinking or tangling of the coils of the snake within the housing.

Coaxially disposed with the axis of rotation of housing 10 are the strengthening flanges 20 and 21. These I prefer to secure by any convenient means to members 14 and 12, respectively and thus provide adequate support to the thin walls of members 12 and 14 so that trunnions 23 and 24 may be fixedly secured to the housing and revolve therewith. Trunnion 23 may be made of solid shafting or preferably, in the interest of lightness, it should be tubing or pipe, as I have illustrated. Secured to trunnion 23 in some convenient manner is a crank, having the crank handle 26. In Fig. 5, I have illustrated this construction as being made out of pipe nipples and elbows. This is a convenient way, as adequate strength is achieved with the minimum of weight. As the tool must be constantly moved about by hand, weight is a very important factor.

Trunnion 24 on the opposite side of housing 10, must of necessity be tubular in form so that the snake S may pass through it. Secured fixedly to trunnion 24 is a snake clamp unit 30. The details of the structure embodied in clamp 30 are probably best illustrated in Figs. 2 and 3. A U-shaped frame member 32 is disposed on trunnion 24 and engages it firmly throughout more than one-half of the circumference substantially in the proportion shown in Fig. 3. This makes a very secure attachment, and then to prevent frame 32 from turning on pipe 24, it should be fixedly secured thereto as by welding or brazing. Tube 24 is cut away for substantially half its circumference to provide a pawl or operational opening at 34. The general proportions of this opening are best illustrated in Fig. 2.

Pivotably secured within the confines of the upwardly extending portions 36 and 37 of frame 32 is the pawl lever 40. This lever should form a smooth oscillating fit within the upright members 36 and 37 and be pivotably secured as by the through rivet or bolt 42. In the head end of lever 40, I provide a guideway as 44 in which is slidably disposed the pawl block 46. This block should be of hardened material and should be knurled or toothed at 48, so as to provide a large area of contact for the engagement of snake S. This is an important factor in the construction of this type of equipment. If for instance, a set screw is used in an attempt to hold the snake in place, so much pressure has to be applied and it is so localized in one spot that a serious distortion of the snake occurs which ultimately, when it is repeated over and over again, soon destroys the snake itself. I therefore have found that the pawl block 46 should have considerable extent both transversely and longitudinally so that engagement with snake S can be distributed over sufficient area without requiring excessive pressure, but still hold the snake securely enough for all operational needs. The exact positioning of pawl block 46 within guideway 44 is adjustably maintained by the set-screw 50.

Pivotably secured, as at 52, to the opposite end of pawl lever 40 is the toggle lever and handle 54. In Figs. 1 and 5, I have illustrated this handle in its closed position, and in Fig. 2, it is in its open or released position. In the released position, the hand grip portion 56 is substantially in the vertical position. The lower portion of handle 54, as shown in Fig. 2, is slightly bifurcated at 58, so that it forms a saddle which rides over and is slidable upon tube 24. When pressure is applied to the hand-grasped portion 56 of the handle, and it is revolved to the right as shown in Fig. 2, the saddle portion 58 lies upon tube 24, and the pivot point 52 is raised upwardly, which causes the pawl carrying end of lever 40 to move downwardly and securely grip snake S. The exact amount of this gripping will be dependent upon the positioning of pawl 46, by virtue of adjustment of the screw 50. It should always engage a snake sufficiently to hold it against the longitudinal and torsional strains applied to the snake, and this is considerable when the mechanical advantage provided by handle 26 is taken into account. The construction of saddle 58, in its

relationship to the pivot point **52**, should be such that the actual bearing point of saddle **58** upon tube **24** will move it to the left, as viewed in Fig. 2, beyond a vertical line through pivot **52**; thus a locking toggle joint is provided and no keeper arrangement is then required.

It has been found that a copper or bronze bearing surface disposed directly below pawl **46** adds very materially to the gripping action of my clamp. In Fig. 3 I have shown such a surface at **57** formed preferably as the head of a rivet **59** which serves to secure frame member **32** to pipe **24**.

In order to get maximum usefulness from my type of equipment, making it expedient to handle at all times, I provide bearings **60** and **61** in which trunnions **24** and **23**, respectively, are revolvably mounted. Bearings **60** and **61** are in turn supported by some suitable framework. Here again, it is desired that reasonable stability be taken as one element of the design as against the actual weight which should be kept to a minimum. I have employed a double A frame construction, which is probably best illustrated in Figs. 1, 4 and 5, in that I have substantially identical end units **64** and **65**, which support the frame and which, in turn, are tied together as by transverse cross-members **66** and longitudinal cross-members **68**. It is apparent that I have taken maximum advantage of the trussing permitted by the A frame design so as to have a light-weight unit, one that does not interfere with the operation of crank **26** or lock unit **30**, and which in turn has sufficient spread at floor level, to give a large measure of stability to the equipment. I have found it desirable to mount my A frame on runners, as **70** and **71**. The utility of these runners will be best understood in viewing Fig. 1. Here it will be noted that the snake S is secured by clamp **30**, and as the operator turns crank **26**, he can at the same time turn, press inwardly, or pull outwardly on the snake, thus making it function in all ways as though he had direct hold on the snake, but with the great convenience and cleanliness which my equipment provides.

In operating my equipment, the plumbing fixtures must be partially disassembled, as shown in Fig. 1, and then the snake S with clamp **30** unlocked, can be pulled out by hand and entered into the plumbing fixture and be propelled by short strokes with the hand until resistance is encountered. At that time, the operator should engage clamp **30**, and then by grasping handle **26**, he can revolve the snake, and at the same time he can press forward on the entire device and thus feed the snake into the pipe with considerable applied force. This operation is commonly done in successive stages of short strokes, and that is one of the reasons why it has been found that pipe **24** should be a reasonable length so that it is possible to have it close up against the pipe entrance when the stroke is completed and then, by releasing clamp **30**, it can be pulled away from the pipe opening, as for instance at **75**, as shown in Fig. 1, an amount which the operator from experience knows he can shove the snake into the pipe without fear of the unsupported portion kinking. The removal of the snake from the pipe is achieved in a reverse maneuver, it being necessary for short runs to unclamp and re-clamp the gripping member **30**; however, it has been found that many times where the snake is being removed, the whole A frame and its supported assembly can be moved sometimes several feet, drawing the snake with it, and thus speed up the operation of withdrawing the snake.

As a convenience in carrying my housing **10** and further to provide means for hanging the whole unit to an overhead member, I provide a bail member **80**. Bail **80** has eyes at **81** and **83** adapted to fit loosely over pipes **23** and **24**. In carrying or supporting my device the bail swings to a vertical position.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of a device for operating and housing a plumber's snake.

Having thus disclosed the invention, I claim:

A clamp, for a flexible cable snake in a sewage pipe cleaning device, comprising: a housing having an opening therethrough to accommodate such snake; on one side of said opening a cuprous bearing member; on the other side of said opening a pivotally mounted clamp lever; said clamp lever having a guideway aligned with said bearing member; a clamp jaw positioned in said guideway and slidable to move toward and away from said bearing member; screw means for adjustably positioning said clamp jaw in said guideway; a toggle locking lever pivotally connected to the other end of said clamp lever to move said clamp jaw toward said bearing member and to lock said clamp jaw in position; and said clamp jaw having a large clamp face with a plurality of tooth ridges spaced apart one from another transversely of such snake, each ridge being substantially straight and being parallel to the axis of such snake.

JAMES S. HERMANSON.

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