This invention relates to a device adapted particularly for use in connection with the sucker rods and tubing in an oil well pumping organization. It is well known to those familiar with the art that in certain types of crude petroleum which contain a large percentage of wax or asphaltic compounds, that these compounds tend to deposit and accumulate upon the inner surface of the tubing through which the petroleum is removed from the well and upon the rods actuating the pumping device.

It is a primary object of this invention to produce a device of simple form and construction embodying an improvement upon the organization disclosed in our copending application, Serial No. 278,758, which is reciprocably and rotatably mounted upon the sucker rod and is so formed as to scrape the inner surface of the tubing and the outer surface of the rods, and prevent the deposition of solid materials as mentioned above.

It is also an object of this invention to produce an organization of the class described which will function as a guide for the sucker rod, preventing the rod from engaging the inner surface of the tubing. The guide being reciprocable as mentioned above, the wear between the reciprocating members and the tubing is materially reduced due to the fact that this wear is distributed over a much greater area than in the case where the sucker rod itself rests upon the inner surface of the tubing, and for the same reason the wear on the sucker rods is much less than would be the case in the use of fixed guides.

In the organization disclosed in our copending application, the scraping guides are formed in a manner such that it is necessary, in order to place them upon the sucker rods, either to place the guides upon the rods during the manufacture of the rods or to sever the sucker rods and re-splice them for each section that carries one or more of the guides.

It is the primary object of this invention to develop an organization in which this feature is overcome by making the guides in two or more sections which are adapted to be held in co-operative engagement by members such as threaded collars.

The details in the construction of this invention, together with further objects attending its production, will be better understood from the following description of the accompanying drawings, in which

Fig. 1 is an elevational view partly in section showing a tubing member having a sucker rod equipped with an embodiment of the invention suspended therein.

Fig. 2 is a perspective view illustrating a preferred embodiment of the invention.

Fig. 3 is a plan view which may be considered as having been taken substantially in a plane represented by the line 3—3 in Fig. 1.

Fig. 4 is a partial sectional elevation which may be considered as having been taken in a plane represented by the line 4—4 in Fig. 3.

Fig. 5 is a sectional elevation which may be considered as having been taken in planes represented by the lines 5—5 in Fig. 3.

Fig. 6 is a detached partial sectional elevation illustrating the construction of a preferred form of joint between a blade and a bearing member.

The general construction of this invention embodies a plurality of blades which are preferably formed as partial spirals adapted to scrape the inner surface of the tubing and the outer surface of the rods and are symmetrically arranged about an axis which is concentric with that of the sucker rod upon which the guide is mounted. The ends of these blades are suitably mounted in bearing members, such bearing members being in the form of co-operating sections which are adapted to be held in assembled relationship by means such as threaded collars.

More particularly describing the invention as herein illustrated, reference numeral 11 indicates an oil well tubing adapted to receive a sucker rod 12 comprising sections 12a and 12b which are united by means of the couplings indicated at 12c. The sucker rods are illustrated as being of the standard form commonly used in oil well pumping operations, and the scraping guides embodying our invention are indicated generally by reference numeral 13, and in Fig. 1 are illustrated as being mounted upon the sucker rod 12.

The details in the construction of the scrap-
ing guide 13 are best illustrated in Figs. 2 to 6 inclusive in which the guide is illustrated as comprising a plurality of spiral shaped blades 14, the ends of which are supported in bearing members generally indicated by reference numeral 15.

Bearing members 15 are illustrated as embodying oppositely disposed and co-operatively formed segments 16 and 16′, the outer ends of which co-operate to form what may be termed an outwardly threaded hub section 17 and the inner end of the hub section thus formed, terminates in an outwardly extending flange or shoulder 18.

The flange or shoulder 18 is provided with a plurality of notches indicated at 19 and the hub section 17 is provided with a plurality of recesses 20 which co-operate with the notches 19 to receive the ends of the blade members in the manner best illustrated in Figs. 4 and 6.

It will be noted in Figs. 4 and 6 that the end 21 of each blade member 14 is provided with an outer notched section indicated at 22 and an inner notch indicated at 23. The inner notch 23 is adapted to receive a projection 24 which is formed upon the bearing member by notch 19 and recess 20 in the flange 18 and the hub member 17 respectively. In order that this construction may be made more rigid, it is preferable to unite the blades with their respective bearing segments by means such as welding or soldering. The segments 16 and 16′ together with the blades supported therein are held in assembled relationship by means such as an internally threaded collar indicated at 25, and in order that the organization may be assembled upon the sucker rod, the collars 25 must necessarily be of greater inside diameter than the outside diameter of the couplings 12.

In the form of the invention chosen for the purpose of description, the top and bottom bearing members being identical, the elements of these members are indicated by the same reference numerals and as was mentioned in connection with our co-pending application it is a feature of this invention to so form an organization that the passage of fluid in the tubing tends to rotate the scraping guide on the sucker rod. This is accomplished by providing a plurality of apertures 26 in the hub sections 16 and 16′, such apertures being formed in a manner such that the fluid passing therethrough is impinged against the spiral surface of the blade opposite the aperture. This flow of fluid through the apertures 26 imparts a rotative movement to the blades and assures a more efficient scraping action against the inner surface of the tubing, and the outer surface of the sucker rods.

It will be understood that while we have herein described and illustrated one preferred embodiment of this invention that the invention is not limited to the precise construction set forth, but includes within its scope such changes as may fairly come within the spirit of the appended claims.

We claim as our invention:

1. For use in combination with a well tubing and a sucker rod, a tubing cleaner embodying: bearing members adapted to be rotatably mounted upon said sucker rod; and radially extending blades interposed between said bearing members, said bearing members comprising a plurality of segments, and collars holding said segments in assembled relation.

2. For use in combination with a well tubing and a sucker rod, a tubing cleaner embodying: bearing members adapted to be rotatably mounted upon said sucker rod; and radially extending spiral shaped blades interposed between said bearing members, said bearing members comprising a plurality of segments having flanged portions to support said blades and threaded portions to receive a collar, and collars holding said segments in assembled relation.

3. For use in combination with a well tubing and a sucker rod, a tubing cleaner embodying: bearing members adapted to be rotatably mounted upon said sucker rod; radially extending spiral shaped blades interposed between said bearing members, said bearing members comprising a plurality of segments having flanged portions to support said blades and threaded portions to receive a collar, and collars holding said segments in assembled relation.

4. For use in combination with a well tubing and a sucker rod, a tubing cleaner embodying: bearing members adapted to be rotatably mounted upon said sucker rod; radially extending spiral shaped blades interposed between said bearing members, said bearing members comprising a plurality of segments having flanged portions to support said blades and threaded portions to receive a collar, and collars holding said segments in assembled relation.

5. For use in combination with a well tubing and a sucker rod, a tubing cleaner embodying: bearing members adapted to be rotatably mounted upon said sucker rod; radially extending spiral shaped blades interposed between said bearing members, said bearing members comprising a plurality of segments having flanged portions to support said blades and threaded portions to receive a collar, and collars holding said segments in assembled relation.
between said bearing members, said bearing members comprising a plurality of segments having flanged portions to support said blades and threaded portions to receive a collar, and collars holding said segments in assembled relation, said blades and said segments being provided with co-operating shoulders and recesses to form lock joints therebetween, said collars being adapted to circumscribe the outer ends of said blades.

7. For use in combination with a well tubing and a sucker rod, a sucker rod scraping device embodying: bearing members adapted to be rotatably and reciprocably mounted upon said sucker rod; and radially extending blades interposed between said bearing members and having inner edges in engagement with said rod, said bearing members comprising a plurality of segments, and collars holding said segments in assembled relation.

8. A scraping device of the character described embodying: bearing members adapted to be rotatably and reciprocably mounted upon a sucker rod, and comprising a flanged section having blade receiving notches formed therein; scraping blades having their outer ends mounted in said notches, said bearing members comprising a plurality of segments; and collar members for holding said segments in assembled relation.

In testimony whereof, we have hereunto set our hands at Los Angeles, California, this 19th day of December, 1928.

JOHN C. ARMSTRONG.
JOSEPH E. WALLIS.