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F. M. GIST

2,594,550

MULTISECTION PIPE PROTECTOR

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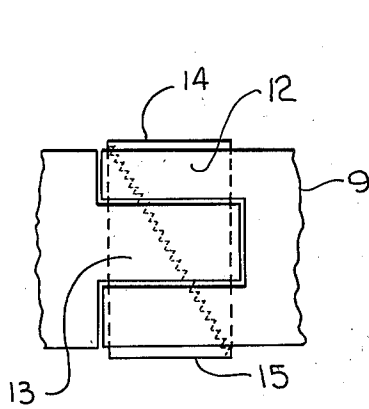


Fig II

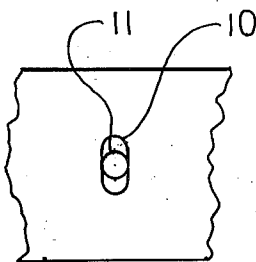


Fig III

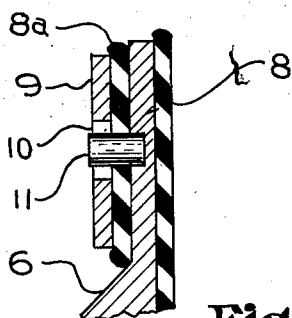


Fig IV

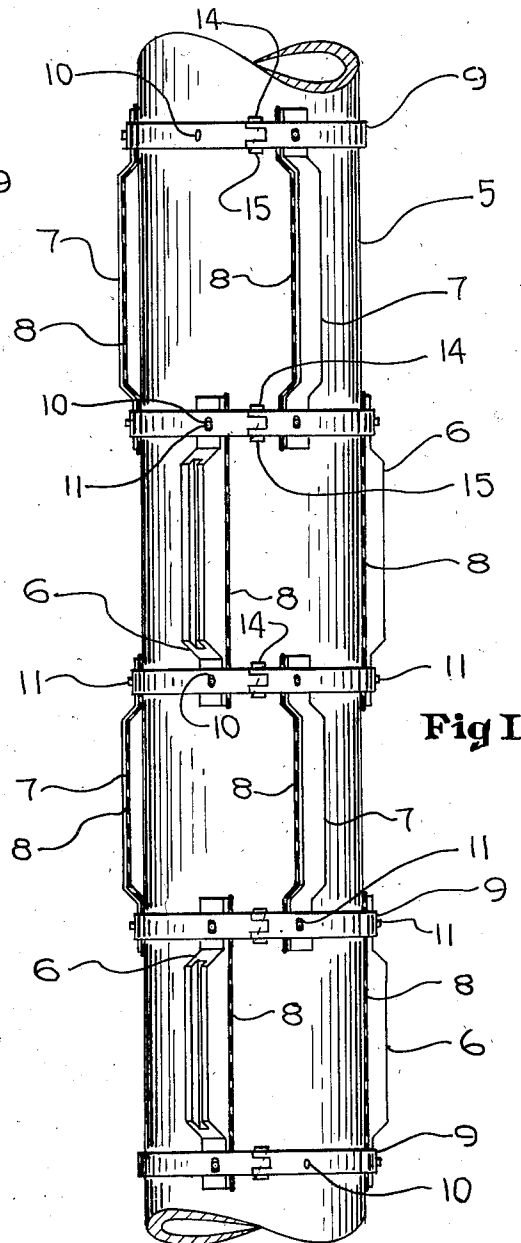


Fig I

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UNITED STATES PATENT OFFICE

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MULTISECTION PIPE PROTECTOR

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6 Claims. (Cl. 166—4)

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This invention relates to centralizers for well pipe and essentially provides for a novel arrangement of individual parts, such for example, as are shown in my co-pending applications Serial Numbers 149,686 and 149,687, both filed March 15, 1950, whereby a longitudinal series of centralizer elements may be interlockingly, and selectively assembled about and along a well pipe.

Such an arrangement permits of extension of my centralizers over desired lengths of pipe with a minimum number of retaining parts at considerable savings, and also any stresses tending to move or shift the centralizers along the pipe will encounter the greater resistance offered by the combined assembly.

These and other novel features will clearly be apparent from the following description together with the accompanying drawings in which:

Fig. I is an elevation of a section of pipe and centralizer assembly.

Figs. II, III, and IV show some of the parts in more detail.

In the several views like references indicate similar parts wherein 5 is a well pipe, 6 is a rigid type centralizer, while 7 is a yieldable type centralizer. Both centralizers are faced with a resilient material such as a rubber compound 8 with preferably high dielectric strength. Bands 9 of strong material such as spring steel extend around the centralizers and the pipe. These bands also in preferred form are faced with the rubber compound 8a shown more clearly in Fig. IV. The retaining bands have slots or openings 10 for receiving pins 11 which project outwardly from centralizers 6 and 7 whereby the latter are secured in spaced relation during and after assembly about the pipe. As the bands 9 are brought into position about the pipe and centralizers, the eye shaped ends 12—13 are brought into registry and tapered lock pins 14—15 are inserted in the eyes and driven together to bring the bands tightly down around the centralizers and pipe to distort the resilient material and to bring the bands into tension about the assembly with such force as to secure the entire assembly against dislodgment or disarrangement.

If preferred the lock pins may have serrated mating faces whereby their assembled relation is more securely retained. A single tapered lock pin could be used, if desired, at each joint in the bands, the taper providing a wedge effect when driven in the joint to tighten the band.

The operation is as follows:

One of the bands 9 is passed around pipe 5

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after having received the pins 11 of one end of selected centralizers through its slots 10, the eyed ends 12—13 of the band are brought into registry and lock pins 14—15 inserted there-through to secure that part of the assembly. The second band is now brought into place and pins 11 on the now free ends of the first centralizers are passed through selected openings 10 of the second band and a second series of centralizers are engaged at one end by the band which receives their similar projections. The second band is then closed and secured by lock pins in like manner as the first band. Other centralizers and bands may be employed to extend the chain assembly along the pipe at will, and finally all of the lock pins are driven home to tightly compress and distort the resilient material 8 and 8a under the bands and centralizers. The bands themselves may be distorted inwardly under tension so that their constant effort to return to original shape, assisted in such efforts by the tendency of the resilient material to also regain its original shape, will hold the assembly securely about the pipe.

When more than two bands with interposed centralizers are employed it is evident that forces which might dislodge or move the assembly axially along the pipe will be restrained by the combined gripping action of the several bands thus adding greatly to the ability of my centralizers to resist these forces. It is further obvious that any desired combination or arrangement of the parts may be employed and that all such arrangements will properly fall within the scope of the following claims.

I claim:

1. A well pipe centralizer assembly comprising a plurality of lengths of centralizers annularly spaced on the well pipe and arranged in longitudinally adjacent series; a plurality of retaining bands each engaging the centralizers of adjacent series at their respective ends, the bands and centralizers having inner faces of resilient dielectric material; and means for progressively tightening the bands about the centralizers.

2. A well pipe, a centralizer assembly therefor, comprising a plurality of lengths of centralizers annularly spaced on the well pipe and arranged in longitudinally adjacent series; a plurality of retaining bands each engaging the centralizers of adjacent series at their respective ends, the centralizers and the bands having means for interlocking engagement at their intersections and having inner faces of resilient dielectric material, and other means for progres-

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sively closing and tightening the bands about the centralizers and distorting the resilient dielectric material by compressing it against the pipe.

3. A centralizer assembly for use on well pipe, comprising longitudinally adjacent annular series of spaced centralizers, said adjacent series alternating between series of resilient centralizers and series of rigid centralizers; bands adapted to encompass the pipe; resilient dielectric material on the inner surfaces of the bands and centralizers; means to tighten the bands on the pipe, each band passing over the ends of the centralizers of adjacent series; and interlocking means on the ends of said centralizers engaging complementary means on said bands to maintain the centralizers in spaced relation.

4. A centralizer assembly for use in fixing on well pipe longitudinally adjacent annular series of spaced centralizers, said adjacent series alternating between series of resilient centralizers and series of non-resilient centralizers, each centralizer being faced on its inner side with a dielectric material and said centralizers having at each end an outwardly projecting pin, comprising bands having spaced slots therethrough, said bands being adapted to encompass the pipe and having at their ends intermeshing rings; resilient dielectric material on the inner surface of the bands, said material having holes registering with said slots; and wedge means to transfix said rings and tighten the bands on the pipe, each band passing over the ends of the centralizers of adjacent series, and said pins being located in said holes and slots to maintain the centralizers in spaced relation, the centralizers in one series being staggered with respect to those in the adjacent series.

5. A centralizer assembly for use in fixing on well pipe longitudinally adjacent annular series of spaced centralizers, each centralizer being

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faced on its inner side with a dielectric material and said centralizers having at each end an outwardly projecting pin, comprising bands having spaced slots therethrough, said bands being adapted to encompass the pipe and having at their ends intermeshing rings; resilient dielectric material on the inner surface of the bands, said material having holes registering with said slots; and wedge means to transfix said rings and tighten the bands on the pipe, each band passing over the ends of the centralizers of adjacent series, and said pins being located in said holes and slots to maintain the centralizers in spaced relation.

6. A centralizer assembly for use in fixing on well pipe longitudinally adjacent annular series of spaced centralizers, each centralizer being faced on its inner side with a dielectric material and said centralizers having at each end an outwardly projecting pin, comprising bands having spaced slots therethrough, said bands being adapted to encompass the pipe; resilient dielectric material on the inner surface of the bands; and means to tighten the bands on the pipe, each band passing over the ends of the centralizers of adjacent series, and said pins being located in said slots to maintain the centralizers in spaced relation.

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The following references are of record in the file of this patent:

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2,252,978	Parkin	Aug. 19, 1941