

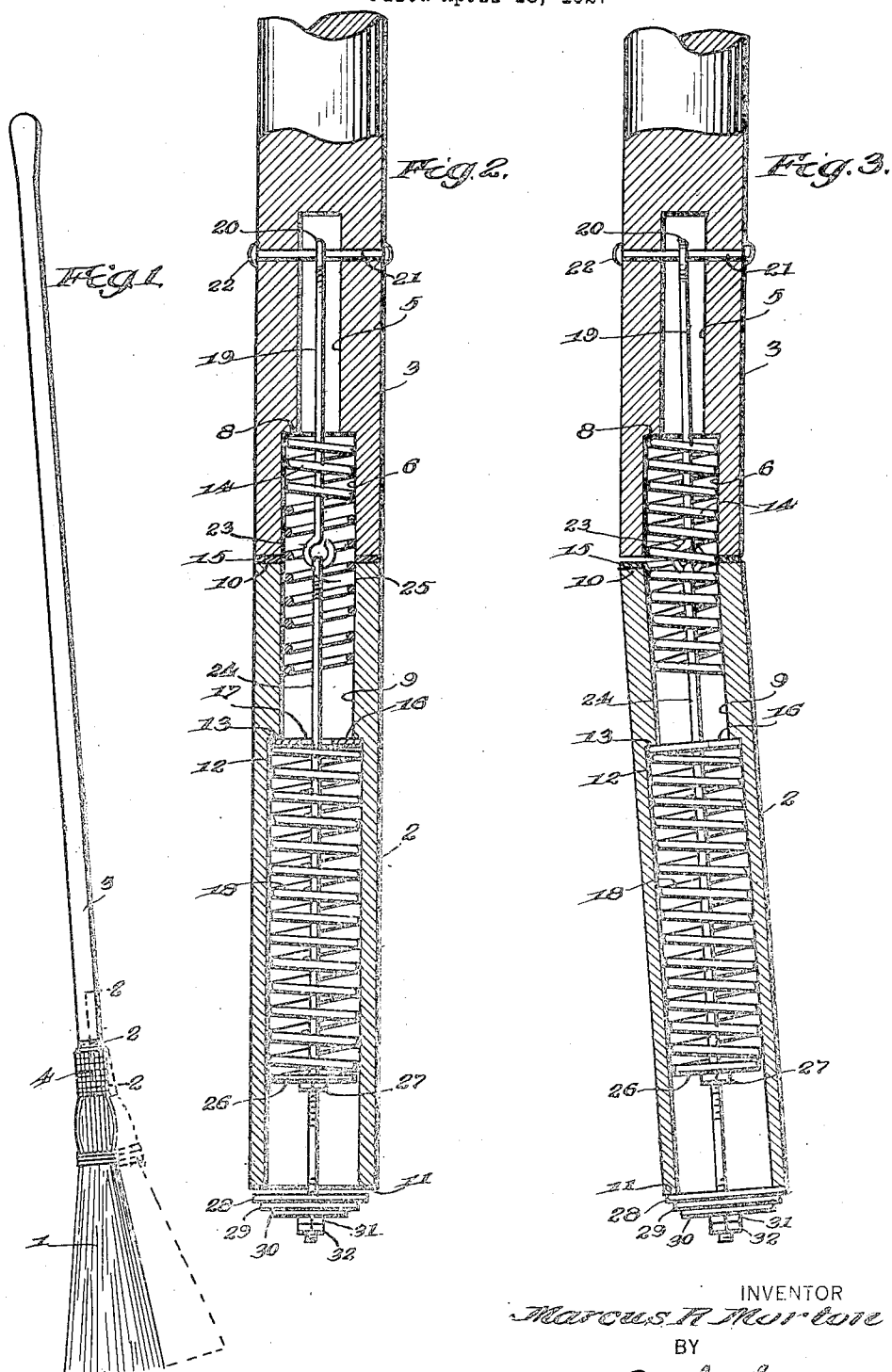
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FLEXIBLE BROOM HANDLE

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FLEXIBLE BROOM HANDLE.

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The object of this invention is to provide novel means affording flexure of implement handles, such for instance as broom handles, so that the handle may participate in the flexure of the broom or implement in such a manner as not only to impart a pickup action to the broom but also to relieve the user of the back strain that now accompanies sweeping work.

One of the features of this invention is to provide a novel means for hingedly connecting the sections of the handle in end to end relation, said means also functioning to maintain said sections in peripheral flush relation when said sections are in alined relation. A further feature of this improved means is to afford flexure of the handle universally in any direction angularly to the longitudinal axis of the handle.

A further feature consists in mechanism extending longitudinally of the handle, and preferably internally thereof, for resisting flexure of the handle sections and restoring them to a position of alined relation.

The invention also includes means for limiting flexure of the handle sections to a predetermined extent, such limiting action being preferably adjustable, and, in the most improved form, being also yielding in nature.

The device of my invention has many other objects and features which will be more fully described in connection with the accompanying drawing and will be more particularly pointed out in and by the appended claims.

In the drawing;

Fig. 1, is a view in elevation showing the device of my invention applied to a broom handle.

Fig. 2, is an enlarged sectional view on line 2—2 of Fig. 1, with the broom portion omitted and illustrating the handle sections in alined relation.

Fig. 3, is a sectional view similar to Fig. 2, with the handle sections illustrated in flexed relation.

Like characters of reference designate similar parts throughout the different figures of the drawing.

The invention is herein shown applied to a broom 1, the handle being formed in sections 2 and 3, which will be termed the broom and handle sections, respectively. In some embodiments, the structure may be applied to closely analogous devices of an im-

plement nature wherein the section 2 might be referred to as an implement section. In the form shown, the straw or other material of which the broom is composed, is built up on section 2 in such a manner as to be rigid therewith, as far as the neck portion 4 of the broom is concerned. Of course, the lower portion of the straw is flexible to the extent that the quality of the straw permits.

I will next refer to the structure whereby the handle is rendered flexible and will later describe the functions it performs.

The handle section 3, is provided with a bore 5, of a relatively reduced diameter which is enlarged at 6, toward its end 7, to form a shoulder 8. The implement or broom section 2, is provided with a bore 9 extending from its upper end 10 to its lower end 11, said bore being reduced at 12 to form an abutting shoulder 13. It will not be necessary to describe the manner in which the neck 4, of the broom is built up on section 2, as the invention does not pertain to that phase of the structure, specifically.

It is a feature of the invention to hinge the sections 2 and 3 in end to end abutting relation and the means employed for the performance of this function also serves to hold the adjacent ends of the sections in peripherally flush relation. In the present construction, this feature is embodied in a yielding means which is shown in the form of a coiled spring 14. This spring 14, is preferably proportioned with respect to the bores 6 and 9, in which it is disposed, so that the spring will fit tightly therein and will thereby be under such a degree of compression radially, as to always function to hold the sections flush. It will be noted that spring 14 is of sufficient length to extend across the abutting juncture of the sections which it unites and the shoulder 8, forms a convenient stop to indicate, when the device is being assembled, that the spring 14 is properly positioned when it engages said shoulder. However, no fastening means for holding the spring 14, is necessary. In practice, I find it advisable and advantageous to interpose a washer 15, between the abutting ends of sections 2 and 3, and experience has dictated that the main function of such washer is to take whatever wear occurs incident to the practically continuous flexure to which the handle structure is subjected in actual use. Thus,

I find that a leather washer meets the requirements. It may be informative to state that while spring 14 will inevitably function to resist flexure and act to restore the sections 2 and 3 to alined relation, as an incident to its main function, which is a hinging function, still, I do not rely upon spring 14 as a restoring spring. I have found in practice that such restoring action from a spring in the location of spring 14, would localize the stress on just those convolutions adjacent the abutting juncture and hence the restoring action would not be sufficient. Further, with the feature for restoring the sections 2 and 3, which will be presently described, the spring 14 is not subjected to the abnormal and localized stress that would occur if reliance were placed wholly on spring 14 as a restoring agent.

I will next describe the novel mechanism for restoring sections 2 and 3 to alined relation.

I preferably employ an abutment washer 16, which is seated against shoulder 13, and which forms a fixed abutment for a restoring spring. Said washer is provided with a centrally disposed opening 17, the purpose of which will presently appear. A part of my restoring mechanism consists of a coil spring 18, which is preferably a contractile spring normally acting to extend itself in the direction of its length. The normally upper end of said spring 18, engages abutment 16, and it will be seen that the spring 18 occupies bore 12, of section 2.

I will next describe the tension rod portion of my improved restoring means.

I employ a tension rod which is capable of flexure transversely to its length, and in the present construction, this feature is embodied in a jointed rod. As shown, the upper section of the tension rod is designated at 19 and is anchored in section 3. I form an eye 20, at the upper terminal of said rod section 19, which is connected with a pin 21 that extends transversely through section 3, as shown. The outer ends of said anchoring pin 21, may be suitably headed, as shown at 22. Bore 5, affords ample clearance for lateral movement of section 19, when necessary and would permit the use of a non-flexible rod. The lower end of rod section 19 terminates in an eye 23 and extends inside of spring 14. A lower rod section is designated at 24 and extends centrally through springs 14 and 18 and through opening 17 in washer 16, and downwardly or axially slightly beyond handle section 2, as shown. The upper end of section 24 terminates in an eye 25 which engages eye 23 at a point coincident with the plane of abutting juncture of sections 2 and 3 so that the jointed connection will be located at a point to synchronize the flexure of the handle and rod sections. A tension washer 26 forms the lower

abutment for spring 18, and a nut 27, threaded on rod 24, may serve to apply the required tension to spring 18. In practice, nut 27 is adjusted so that spring 18 will always be under compression, the poundage of which will of course be regulated by the character of work to be performed and the extent of flexibility desired. On the lower end of section 2, I dispose a rigid washer 28, against which a yielding washer 29, rests. An end washer 30, acting as a protector, is disposed against yielding washer 29. The rod section 24 extends through said washers and I employ lock nuts 31 and 32 for coaction with said washers and rod section. The lock nuts 31 and 32 are normally in spaced relation to the washers or are adjusted so that the washers just described, which I will term limiting washers, will not be in engagement with the lower end of section 2, when sections 2 and 3 are in alined relation. When sections 2 and 3, have been flexed to the limit desired, the limiting or cushioning stop prevents flexure of sections 2 and 3 beyond a predetermined extent as shown in Fig. 3. In other words, it will now be clear that after the spring 18, has been placed under compressive tension to the limit to which flexure is permitted, then, the cushioning stop comes into place and the rod sections 19 and 24, sustain the stress of limiting flexure of the handle sections. Hence, in no event, could spring 18 be subjected to a compression stress that would amount to a strain.

It will now be clear that in the performance of the restoring function, the major spring 18 sustains the stress wholly in the direction of its length, and that the minor spring 14, in the performance of its hinging function, takes the stress transversely of its longitudinal axis.

It will also be noted that the sections 2 and 3 are at all times free to assume relatively different rotative positions and are not non-rotatively connected. Thus, if the user gripped the handle in a manner so that the broader sweeping side of the broom was not exactly parallel with the floor surface, the sections 2 and 3 would rotatively adjust themselves.

A special feature of importance is that the handle sections 2 and 3 are free to flex in any direction transversely of their joint longitudinal axis, hence, if the user wishes to sweep with the end edge of the broom foremost, as in cleaning a corner or an edge of the floor, the advantages of flexure will always be available.

It is believed that the device of my invention will be fully understood from the foregoing description, and while I have herein shown one specific form thereof, I do not wish to be limited thereto except for such limitations as the claims may import.

I claim:

1. In a flexible broom handle, hollow handle and broom sections hinged to each other in end to end relation, a rod consisting of a plurality of lengths joined together and having one length thereof secured to one of said sections and a joint of said rod being disposed at the juncture of said sections, a spring in the other of said sections connected with the remaining portion of said rod to coact therewith for restoring said sections toward an alined relation.

2. In a flexible broom handle, hollow handle and broom sections in end to end relation, spring means in said sections acting angularly to the longitudinal axis of said sections for maintaining the latter in peripheral flush relation, and separate spring actuated means in said sections and acting longitudinally thereof for restoring said sections toward an alined relation.

3. In a flexible broom handle, hollow handle and broom sections in end to end relation, a minor coiled spring in said sections extending across the juncture thereof and acting expansively to maintain said sections in peripheral flush relation and resisting flexure thereof, and a major coiled spring operatively connected in one of said sections

and acting in the direction of the length thereof and said spring for restoring said sections toward alined relation.

4. In a device of the class described, an implement handle comprising hollow handle and implement sections in end to end relation, a minor coil spring sleeved in said sections and extending across the juncture thereof to hinge said sections together, a jointed tension rod having an upper member anchored in said handle section and extending through said spring and having its joint at the juncture of said sections, said implement section having a lower enlarged bore forming an abutting shoulder, a contractile spring seated against said shoulder, said tension rod having a lower member extending through said contractile spring and downwardly to the lower end of said implement section, means on said lower member of said rod coacting with said contractile spring to restore the sections to alined relation, and means coacting with the lower end of said implement section and the lower end of said tension rod member for limiting flexure of said sections to a predetermined extent.

In witness whereof I hereby affix my signature.

MARCUS R. MORTON.