May 26, 1970 L. L. LOCKWOOD 3,514,782

FOLD-OVER ANTENNA BOOM

Filed May 27, 1968

FIG. 1

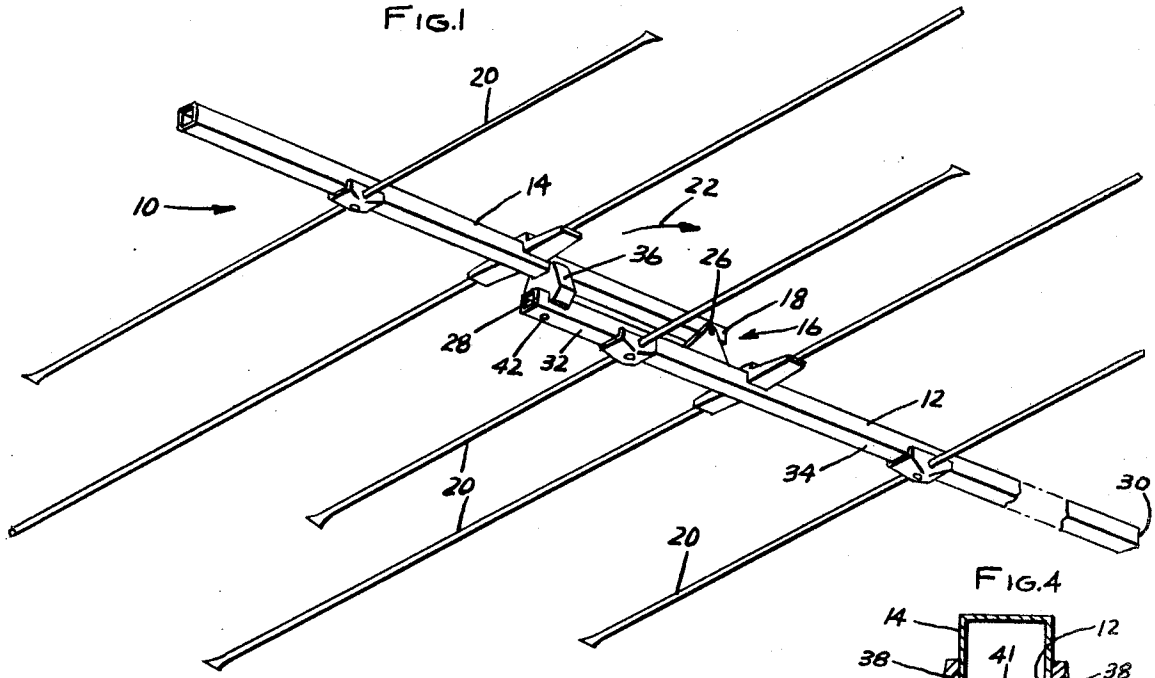


FIG. 4

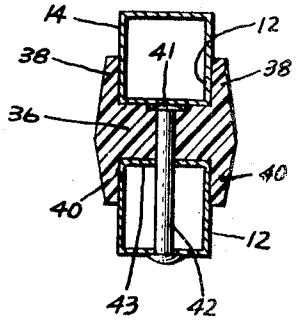


FIG. 2

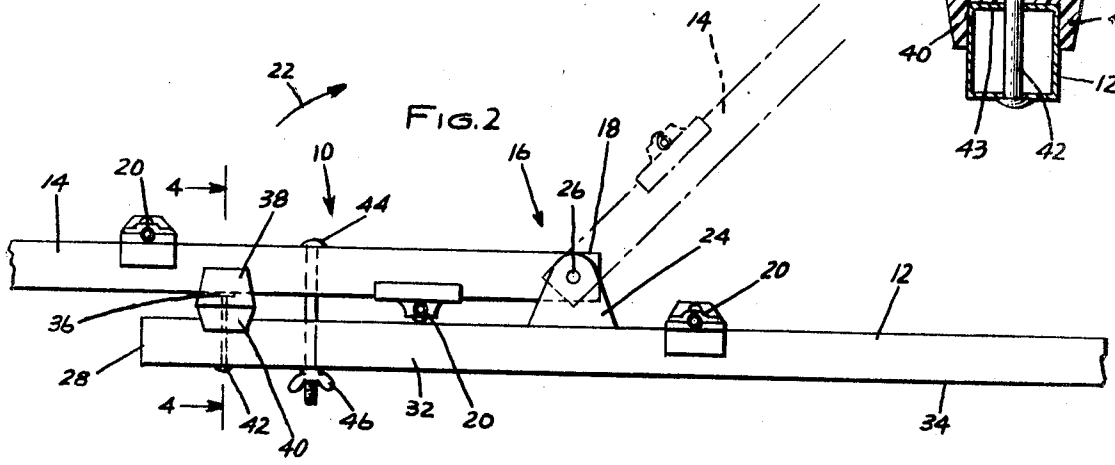
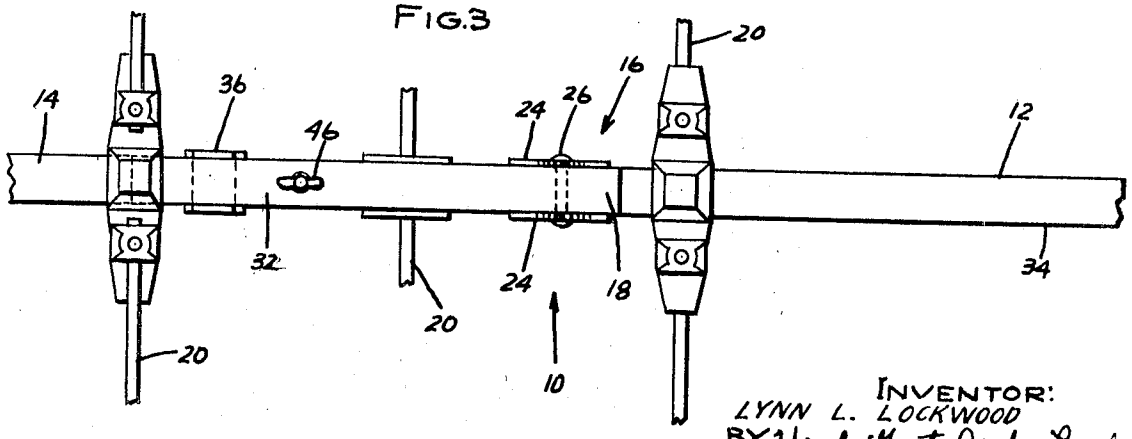


FIG. 3



INVENTOR:
LYNN L. LOCKWOOD
BY Hood, Gust, Irish & Lundy
ATTORNEYS.

United States Patent Office 3,514,782
Patented May 26, 1970

3,514,782

FOLD-OVER ANTENNA BOOM

Lynn L. Lockwood, Road 3, Burlington, Iowa 52601

Filed May 27, 1968, Ser. No. 732,357
Int. Cl. H01q 3/02
U.S. Cl. 343—882 9 Claims

ABSTRACT OF THE DISCLOSURE

An improved antenna assembly wherein the improvement comprises a first boom, a second boom, at least one antenna field element mounted on each of the booms, and means for pivotally connecting one end of the second boom to the first boom, the connecting means being disposed intermediate the ends of the first boom to define first and second opposite end portions thereof. The second boom is pivotably movable between a first position in which it is parallel with and adjacent the first end portion of the first boom and a second position in which it is parallel with and adjacent the second end portion of the first boom, the distal end of the first end portion terminating at a point intermediate the ends of the second boom when it is in its first position. Means is provided for fastening the second boom in its first position. Preferably, the second boom is disposed above the first boom and the assembly includes means disposed adjacent the distal end of the first portion and extending upwardly therefrom to engage and support the second boom in its first position.

BACKGROUND OF THE INVENTION

Field of the invention

The present invention relates generally to antenna assemblies, and particularly to the provision of an improved antenna assembly comprising a first boom and a second boom pivotally connected to the first boom to be foldable back thereover, each of said booms carrying at least one antenna field element.

Description of the prior art

Antenna assemblies of the type commonly used for receiving television broadcasts conventionally comprise a single boom on which the various antenna field elements, such as dipoles, reflectors and directors, are mounted. Since, in some cases, such booms may be more than twelve feet long, it is very cumbersome to ship and handle such antenna assemblies. Further, it is rather difficult for an installer to handle such a long boom when he is on the roof of a building. It will be appreciated that an installer faces difficult and often hazardous conditions on a roof of a building and that such long booms tend to make his job even more difficult and more hazardous. For instance, the longer a boom assembly is, the more difficult it is to carry and hold when the wind is moving at a relatively high velocity.

The antenna assembly of the present invention is an improvement over such conventional boom assemblies in that a foldable boom is provided to facilitate packaging, shipping and installing of the assembly.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an antenna assembly comprising a pair of booms and means for pivotally connecting one end of one of the booms to a point intermediate the ends of the other boom, the said one boom being pivotally movable 180° between a first position in which it extends outwardly over one end portion of the said other boom to a second position in which it is parallel to and adjacent the opposite

end portion of the said other boom. It will be appreciated that, when the pivotally movable boom is in its second position, the antenna assembly will be significantly shorter and thus easier to handle and package.

Another object of the present invention is to provide such an assembly including support means disposed on the said other boom adjacent the distal end thereof over which the pivotally movable boom extends when it is in its first position, the support means being arranged to engage and support the movable boom in that position.

Another object of the present invention is to provide such an antenna assembly in which such support means is an insulative member rigidly fastened to the stationary boom, the member being formed to provide an upwardly opening socket for receivably engaging the pivotally movable boom.

A further object of the present invention is to provide such an antenna assembly including fastening means effective to hold the pivotally movable boom in such a socket.

Other objects and features of the present invention will become apparent as this description proceeds.

The above-mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will be best understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary perspective view of an antenna assembly comprising the improvement of the present invention;

FIG. 2 is a fragmentary elevational view, slightly enlarged, of the antenna assembly;

FIG. 3 is a plan view taken from the top of FIG. 2; and

FIG. 4 is a sectional view taken from FIG. 2 generally along the line **4—4**.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, it will be seen that there is illustrated an antenna assembly **10** comprising a first boom **12**, a second boom **14**, means **16** for pivotally connecting one end **18** of the second boom to the first boom, and a plurality of conventional antenna field elements **20** mounted on each of the booms. Any number of types of field elements can be mounted on the booms **12, 14** without departing from the scope of this invention. Further, the manner in which each field element is connected to one of the booms **12, 14** is unimportant to this invention.

Preferably, and in the illustrative embodiment, the booms **12** and **14** have substantially square cross sections as illustrated in FIG. 4. It will be understood, however, that booms having other cross sectional shapes may be used in the manner described herein without departing from the scope of the invention. Further, it will be understood that, while aluminum is a desirable and often used antenna material, the material from which the booms **12** and **14** are fabricated is unimportant to the present invention.

The relative length of the booms **12** and **14** can be selected to meet particular design requirements, but preferably, when the boom **14** is folded in the direction of the arrow **22** to be adjacent and parallel with the main body portion of the boom **12**, the overall length of the folded assembly will be no greater than the length of the boom **12**.

The illustrative connecting means **16** comprises a pair of brackets **24** extending upwardly from the boom **12**

and a hinge pin **26** penetrating the brackets and the end **18** of the boom **14** disposed between the brackets. This connecting means **16** is disposed intermediate the ends **28, 30** of the boom **12** to define first and second opposite end portions thereof, the first end portion being indicated by the reference numeral **32** and the second end portion being indicated by the reference numeral **34**. The second boom **14** is pivotally movable through an arc of 180° between its position illustrated by solid-lines in the drawings to its position which is parallel to and adjacent the main body portion, i.e., the end portion **34**, of the boom **12**. In either of its two positions, the boom **14** is preferably substantially parallel with the boom **12**.

The boom **14** is supported in its illustrated solid-line position by means of a support member **36** disposed adjacent the end **28** of the boom **12** to extend upwardly therefrom. In the preferred embodiment, this support member **36** is an H-shaped member having upper legs **38** and lower legs **40** as clearly seen in FIG. 4, the member being fabricated from an insulative plastic material. Referring to FIG. 4, it will be seen that the upper legs **38** define an upwardly opening socket **41** for receivably engaging the second boom **14** and that the lower legs **40** define a downwardly opening socket **43** for receivably engaging the first boom **12**. Preferably, and as illustrated in FIG. 4, the member **36** is rigidly fastened to the boom **12** by means of the illustrated rivet **42**.

Preferably, the upper legs **38** will be spaced apart such that, when the second boom **14** is in its illustrated solid-line position, the legs will snugly engage the vertically extending side walls of the second boom as seen in FIG. 4. Similarly, the lower legs **40** are preferably proportioned and designed snugly to engage the vertically extending side walls of the first boom **12**. Thus, when the second boom **14** is in its illustrated solid-line position, the member **36** will act to prevent lateral movement of the second boom relative to the first boom **12**.

The second boom **14** may be held in the socket **41** provided by the member **36** by fastening means such as the illustrated threaded fastening element **44** which penetrates the booms **12, 14** and the wing nut **46** which cooperates with the element **44**. Referring to FIG. 2, it will be seen that, when the element **44** and wing nut **46** are removed, the second boom **14** can be pivotally moved in the direction of the arrow **22** about the horizontal axis defined by the hinge pin **26** to its folded position alongside the main body portion **34** of the first boom **12**.

One advantage of the foldable boom assembly of the present invention is that it can be folded and shipped in a much smaller package than would be required for a rigid boom. Another advantage of the boom assembly of the present invention is that an installer can clamp the first boom **12** to a conventional mast before he unfolds the second boom **14** to its extended position. Thus, the folded boom assembly, because of its shorter length, is easier for the installer to handle.

While there have been discussed above the principles of this invention, in conjunction with specific apparatus it is to be clearly understood that this description is made by way of example and not as a limitation to the scope of the invention.

What is claimed is:

1. An improved antenna assembly comprising a first boom, a second boom, at least one antenna field element mounted on each of said booms, means for pivotally connecting one end of said second boom to said first boom, said connecting means being disposed intermediate the ends of said first boom to define first and second opposite end portions thereof, said second boom being pivotally movable between a first position in which it is parallel with and adjacent said first end portion and a second position in which it is parallel with and adjacent said second end portion, the distal end of said first end portion terminating at a point intermediate the ends of said second boom when said second boom is in said first position, and means for fastening said second boom in said first position.

2. The assembly of claim **1** in which said second boom is disposed above said first boom, and including insulative means disposed adjacent said distal end and extending upwardly therefrom to engage and support said second boom in said first position.

3. The assembly of claim **2** in which said insulative means is a member rigidly fastened to said first end portion, said member being formed to provide an upwardly opening socket for receivably engaging said second boom.

4. The assembly of claim **3** in which said fastening means comprises a fastening element penetrating said first and second booms and means cooperating with said fastening element to hold said second boom snugly in said socket.

5. The assembly of claim **2** in which said insulative means is an H-shaped member having upper and lower spaced apart legs, said lower legs defining a socket for receivably engaging said first end portion and said upper legs defining a socket for receivably engaging said second boom.

6. The assembly of claim **5** in which said first and second booms have substantially square cross sections with vertically and horizontally extending wall sections, in which said sockets have substantially square cross sections with said upper and lower legs extending vertically and spaced apart snugly to engage, respectively, the opposite vertical wall sections of said second boom and said first portion.

7. The assembly of claim **6** in which said connecting means defines a pivot axis parallel to said horizontal wall sections of said first and second booms.

8. The assembly of claim **1** in which said second boom is disposed above said first boom, and including support means disposed on said first boom and extending upwardly therefrom to engage and support said second boom in said first position.

9. The assembly of claim **8** in which said support means is disposed adjacent said distal end, said support means being formed to provide a socket for receivably engaging said second boom when it is in said first position.

References Cited

FOREIGN PATENTS

813,612	5/1959	Great Britain.
1,067,118	1/1954	France.
1,362,625	4/1963	France.

ELI LIEBERMAN, Primary Examiner.