March 25, 1958 G. A. LEHMANN 2,828,098

BRACKET ASSEMBLY

Filed April 12, 1954

FIG. 1.

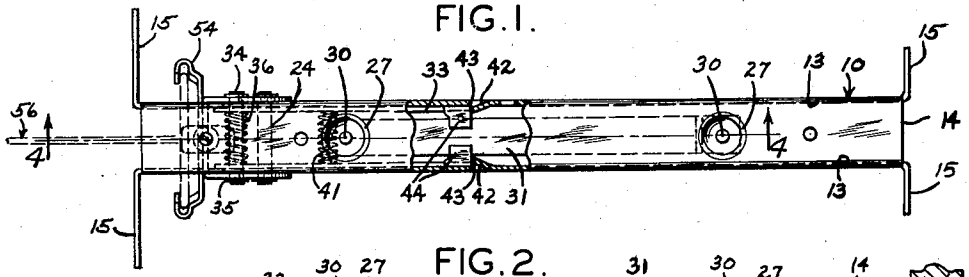


FIG. 2.

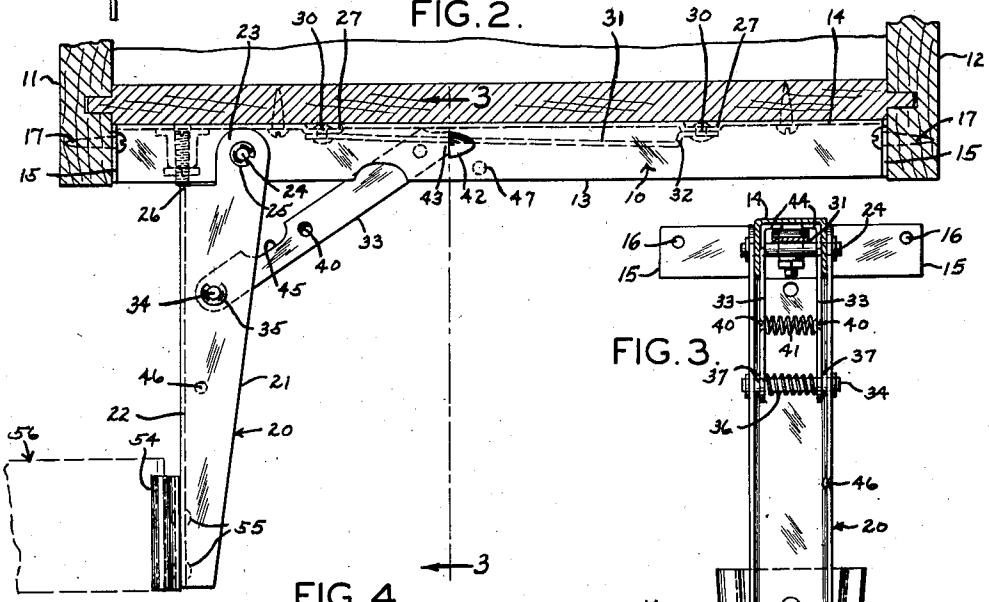


FIG. 3.

FIG. 4.

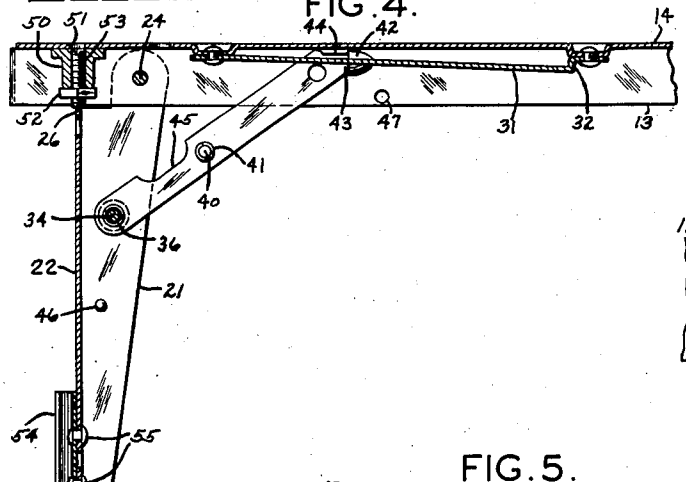


FIG. 6.

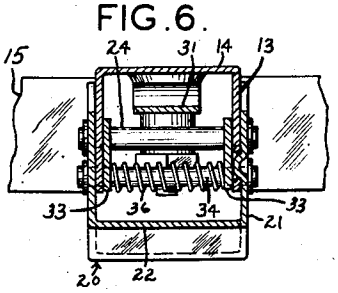
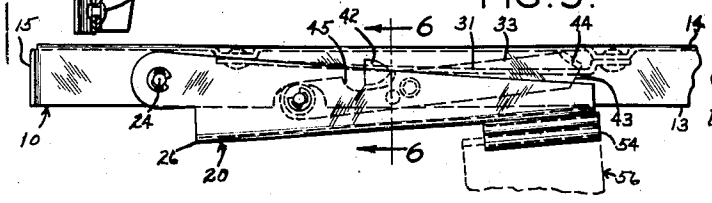


FIG. 5.



INVENTOR,
GEORGE A. LEHMANN
BY Terry & Cohn
ATTORNEY

United States Patent Office 2,828,098 Patented Mar. 25, 1958

2,828,098

BRACKET ASSEMBLY

George A. Lehmann, Ferguson, Mo., assignor, by mesne assignments, to The Dazey Corporation, St. Louis, Mo., a corporation of Missouri

Application April 12, 1954, Serial No. 422,447

8 Claims. (Cl. 248—293)

This invention relates to improvements in bracket assemblies, and more particularly to an improved foldable bracket assembly having means for mounting and supporting appliances, and including means for attaching the assembly to a cabinet.

It is a conventional practice to fasten an appliance such as a can opener, knife grinder and the like directly to a wall structure, and to utilize screws or nails for this purpose. The appliance or the bracket on which it is mounted is usually fixed in a readily accessible location in plain view, which may for several reasons present an undesirable or an impractical arrangement. For example, such an arrangement may be objectionable since it may place the appliance or bracket in an obtrusive location, or the fastening elements may cause visible chipping, cracking or other damage to the wall finish whether it be of tile, wood or metal. Accordingly, it is a major objective of the present improvements to provide a bracket assembly for mounting appliances which may be conveniently fastened below a cabinet in bridging relation to the front and the rear panels, the bracket assembly including a swingable arm adapted for extension to present the appliance in an operative position, and adapted for folding to a substantially concealed position beneath the cabinet when the appliance is not in use.

Another important objective is realized in providing a bracket arm with means for fastening the arm to the underside of a wall cabinet so as to conceal the bracket assembly when in a folded or inoperative position.

Still other important advantages are realized in providing a brace pivotally connected to a swingable arm and to a bracket arm, and a spring means connected to the brace, the spring means being adapted to urge the brace in a direction to realize automatic engagement of the brace with a stop on the bracket arm upon actuation of the swingable arm, whereby to retain the swingable arm in an extended position. The particular disposition of the spring means relative to the brace permits movement of the brace against spring loading to enable operative disengagement of the brace from the stop to effect collapse of the swingable arm.

The foregoing and numerous other objects and advantages of the invention will more clearly appear from the following detailed description of a preferred embodiment, particularly when considered in connection with the accompanying drawing, in which:

Fig. 1 is a top plan view of the bracket assembly, the assembly being partially cut-away to show the operative connection of the braces with the bracket arm;

Fig. 2 is a side elevational view of the bracket assembly as attached to the underside of a cabinet structure, the swingable arm being shown in an extended position, and the dashed lines indicating an appliance;

Fig. 3 is a view of the bracket assembly, partly in cross section, as seen along line 3—3 of Fig. 2;

Fig. 4 is a fragmentary view, partly in cross section, as seen along line 4—4 of Fig. 1;

Fig. 5 is a side elevational view of the bracket assembly showing the swingable arm in a folded or collapsed position, and

Fig. 6 is a fragmentary view in cross section as taken along line 6—6 of Fig. 5.

Referring now by characters of reference to the drawing, it is seen that the bracket assembly includes a bracket arm generally indicated at **10** that normally extends transversely of front panel **11** (Fig. 2) and rear panel **12** of a cabinet. The bracket arm **10** consists of an inverted channel section having spaced side flanges **13** and a bridging piece **14** connecting the side flanges. Each end of the bracket arm **10** is provided with laterally extending flanges **15** formed as a continuation of side flanges **13**, the flanges **15** being provided with apertures **16** (Fig. 3) adapted to receive screws **17** (Fig. 2) that fix the bracket assembly to the cabinet structure.

A swingable arm, referred to at **20**, is pivotally connected to the forward end portion of bracket arm **10**, the swingable arm **20** being of channel section including side flanges **21** and a bridging portion **22**. As is seen in Figs. 2 and 4, the side flanges **21** are located outwardly of and adjacent to the side flanges **13** of bracket arm **10**. More particularly, the side flanges **21** include a pair of spaced finger projections **23** which are pivotally fixed by pin **24** to flanges **13** of arm **10**, the pin **24** bridging the projections **23** and side flanges **13**. A retaining ring **25** is disposed on each end of pin **24**, and is adapted to abut the adjacent finger projection **23** so as to secure the pivotally related arms **10** and **20**.

When swingable arm **20** is moved to the extended position shown in Figs. 2 and 4, the bridging portion **22** is disposed in a substantially vertical plane. The uppermost margin **26** of bridging portion **22** is only slightly spaced from side flanges **13** of bracket arm **10**, the reasons being more fully discussed later.

The bridging piece **14** of bracket arm **10** is depressed at spaced regions along the longitudinal axis of arm **10**. These depressions **27** project inwardly of arm **10** and between side flanges **13**. Secured by rivets **30** to depressions **27** is a guide strip **31** which is horizontally spaced from side flanges **13** as is best viewed in Fig. 1. For reasons which will later appear, the guide strip **31** is provided with an angulate or dog-leg portion **32** near the rear or right hand end (Fig. 4), whereby to realize a regularly increasing dimension between the strip **31** and top bridging piece **14** from the left hand rivet connection to the right hand rivet connection.

A pair of braces **33** are utilized to retain swingable arm **20** in its extended position. One end of each brace **33** is pivotally connected by pin **34** to arm **20**, the pin **34** transversely bridging side flanges **21**. Retaining rings **35** shown in Figs. 1 and 2 are located on each end of pin **34**, and engage adjacent side flange **21**. Disposed about pin **34** is a compression spring **36**, the opposite ends of which engage braces **33**, and tend to urge the braces laterally outwardly. A spacer element **37** is located on pin **34**, and is disposed between each brace **33** and the adjacent side flange **21**. It is important that the apertures in braces **33** which receive and provide a mounting on pin **34** are of sufficient size and dimension to permit the braces **33** to be moved laterally inward along the axis of pin **34** against the loading of spring **36**.

Considerably spaced from the pivotal connection of braces **33** and arm **20**, the braces **33** are provided with instruck lugs **40**. Mounted on lugs **40** is another compression spring **41** which tends to urge braces **33** laterally outward. The opposite ends of braces **33** are forced outwardly by the action of the spring **41** and to a lesser degree by spring **36** into frictional contact with the internal wall of side flanges **13**.

Each of side flanges 13 of bracket arm 10 is provided with an instruck portion that constitutes an abutment 42 that coacts with adjacent brace 33 to retain swingable arm 20 in an extended position. Each abutment 42 is formed to provide an inner camming surface that normally engages the side of the adjacent brace 33 and acts to move the brace inwardly against spring loading when arm 20 is extended. To cooperate with these abutments 42, each of the braces 33 is provided with a shoulder 43 adapted operatively to engage the adjacent abutment 42 upon complete extension of arm 20, the springs 36 and 41 tending to urge the braces 33 laterally outward in a direction to permit automatic operative engagement of shoulders 43 with abutments 42.

The braces 33 are further provided with flanges 44 that are received and retained between guide strip 31 and bridging piece 14 of arm 10. These flanges 44 are horizontally disposed when swingable arm 20 is fully extended so that flanges 44 will effectively abut bridging piece 14 to assist shoulder 43 and abutment 42 in securely holding and locking arm 20. A space is provided between flanges 44 as is shown in Fig. 1 to enable disconnection of shoulders 43 from abutments 42 upon depressing braces 33 laterally inwardly against the loading of springs 36 and 41. As will be apparent from Fig. 5, the flanges 44 will assume a slightly canted position when arm 20 is moved to a folded position. Obviously, the spacing between guide strip 31 and bridging portion 14, as described previously, accommodates this change in angular relation. The flanges 44 and hence braces 33 are constrained to reciprocating movement by guide strip 31 upon actuation of arm 20.

Each of braces 33 is provided with a marginal recess 45 which accommodates instruck abutments 42 when braces 33 and arm 20 are collapsed, as is clearly shown by Fig. 5. A dimple 46 formed in one side flange 21 of arm 20 is adapted for projection into a compatible aperture 47 provided in the corresponding and adjacent side flange 13 of arm 10, hence serving to retain arm 20 in a folded relation. The springse 36 and 41 also serve to hold arm 20 in any angle from the folded to the extended positions since the springs urge braces 33 into contiguous relation and frictional engagement with side flanges 14. Of course, the frictional force is not great enough to impede or obstruct easy sliding actuation of braces 33 on side flanges 13 upon manual operation of arm 20.

To prevent any objectionable play of arm 20 when extended for use, an adjustable means is provided that acts to retain arm 20 in an absolutely rigid position, as is shown in Figs. 2 and 4. Secured to the underside of bridging piece 14 is a boss 50 having a central bore or passage. An aperture 51 is provided in bridging piece 14 in register with this bore. Fastened to the lower end of boss 50 is a nut 52, and located in the bore of boss 50 is a screw element 53 that threadedly engages nut 52. The screw element 53 is readily accessible through the top of piece 14 so as to regulate the vertical extension of its lower end below boss 50. As swingable arm 20 is extended, the margin 26 abuts screw element 53 immediately upon operative engagement of shoulders 43 with abutments 42. This adjustable screw element 53 realizes an arrangement which eliminates certain exacting requirements of manufacture, such as the exact location of pin 24, and the otherwise precise machining of margin 26.

A bracket 54 is fastened by rivets 55 to the lower end of arm 20 (Figs. 2, 3 and 4), and is adapted for mounting an appliance which is generally indicated and shown at 56.

It is believed that the operation and use of the bracket assembly is apparent from the above described structure, but for completeness of disclosure, it will be noted that bracket arm 10 is placed under a cabinet structure, and the flanges 15 are fastened respectively to front and rear panels 11 and 12.

Assuming that the initial position of arm 20 is folded as is shown in Fig. 5, when the arm is swung downwardly about pin 24, the flanges 44 are constrained by guide strip 31 to a predetermined path of movement to assure automatic engagement of shoulders 43 with abutments 42. The spring 41 tends to urge the ends of braces 33 apart into contiguous relation with side flanges 13. As braces 33 are moved forwardly, the brace ends bear against abutments 42, and are cammed inwardly against spring loading. When arm 20 is disposed vertically as determined by engagement of margin 26 with screw element 53, the sides of the braces 33 clear the abutments 42, and hence braces 33 are urged or snapped outwardly so that shoulders 43 operatively engage abutments 42.

To release the braces 33 incident to folding arm 20, the braces are squeezed or depressed inwardly against spring loading to disengage shoulders 43 from abutments 42. Then the arm 20 may be swung upwardly and rearwardly to the collapsed position of Fig. 5. In the preferred structure, the spring 41 is located so that the above described pressure exerted on the braces 33 may be transmitted substantially directly to spring 41. In other words, the spring 41 is located between braces 33 in the region normally gripped to exert force on the braces to effect release of the braces.

Although the invention has been described by making detailed reference to a single preferred embodiment, such detail is to be understood in an instructive, rather than in any restrictive sense, many variants being possible within the scope of the claims hereunto appended.

I claim as my invention:

1. In a bracket assembly, a bracket arm having side flanges, a swingable arm pivotally connected to said bracket arm, an abutment on one of said side flanges of said bracket arm, a pair of braces, one end of each said brace being pivotally connected to said swingable arm, a guide means fixed stationary on said bracket arm, the other end of each said brace slidably coacting with said guide means, and slidably engaging said side flanges, said guide means restraining the brace ends to a predetermined path of movement to insure operative engagement of one of said braces with said abutment, whereby to retain said swingable arm in an extended position, and a spring element disposed between said braces, the spring tending to urge said braces into sliding engagement with said side flanges, and tending to urge said one brace into operative engagement with said abutment, the said one brace being laterally depressible under loading of the spring element to disengage from said abutment.

2. In a bracket assembly, a bracket arm including side flanges, a swingable arm pivotally connected to said bracket arm, a pair of braces, one end of each said brace being pivotally connected to said swingable arm, means for restraining the opposite end of each said brace for reciprocating movement within said side flanges, an abutment on at least one of said side flanges, at least one of said braces having a shoulder adapted to engage said abutment to retain said swingable arm in an extended position, and spring means disposed between said braces, the spring means tending to urge said braces into slidable engagement with said side flanges, and adapted to urge the said brace having said shoulder laterally against one of said side flanges to permit engagement of said shoulder with said abutment, the last said brace being depressible inwardly toward the other brace against the loading of the spring means to disengage said shoulder from said abutment.

3. In a bracket assembly, a bracket arm including side flanges, a swingable arm pivotally connected to said bracket arm, a pair of braces pivotally connected to said swingable arm, an abutment on each of said side flanges, a spring element disposed between and interconnecting said braces, and adapted to urge said braces laterally outward against said side flanges for sliding engagement, each of said braces being provided with a shoulder adapted to engage an abutment to retain the

swingable arm in an extended position, and a guide means fixed in stationary position on said bracket arm adapted to receive and retain a portion of each said brace for reciprocating movement, said braces being depressible toward each other against the loading of the spring element to disengage said shoulders from said abutments to permit folding of said swingable arm.

4. In a bracket assembly, a bracket arm, a swingable arm pivotally connected to said bracket arm, a brace, a pivot pin pivotally connecting one end of said brace to said swingable arm, a spring element operatively connected to said brace, said spring element normally tending to urge said brace toward said swingable arm, said spring element permitting a lateral movement of said brace along said pivot pin and away from said swingable arm, an abutment on said bracket arm, means fixed stationary on the bracket arm for restraining the other end of the brace to a reciprocating movement, said brace including a shoulder normally engaging said abutment to retain the swingable arm in an extended position, a second spring element connected to said brace and spaced from the first said spring element, the second spring element tending to urge the brace in a direction to effect engagement of the shoulder and the abutment, the brace being movable against the loading of said springs to disengage said shoulder and abutment.

5. In a bracket assembly, a bracket arm, a swingable arm pivotally connected to said bracket arm, said swingable arm having side flanges, a pair of braces, a pivot pin connecting one end of each brace to the side flanges, a spring element disposed at said pin and operatively connecting said braces, the spring element normally urging said braces in a direction toward said side flanges, said spring element permitting lateral movement of said braces along said pin against the loading of said spring element, an abutment on said bracket arm, one of said braces having a shoulder normally engaging said abutment to retain the swingable arm in an extended position, means for restraining the other end of each brace to reciprocating movement upon actuation of said swingable arm, and a second spring element disposed between and interconnecting said braces, the brace having the shoulder being movable against the loading of the second spring element to disengage the shoulder from said abutment.

6. In a bracket assembly, a bracket arm having side flanges, a swingable arm pivotally connected to said bracket arm, said swingable arm having side flanges, a pair of spaced braces, a pivot pin connecting one end of each brace to the side flanges of said swingable arm, a spring element disposed about said pin and between said braces, said spring element permitting lateral movement of said braces along said pin against the loading of said spring element, an abutment on each side flange of said bracket arm, each of said braces having a shoulder normally engaging one of said abutments to retain the swingable arm in an extended position, means for restraining the other end of each brace to reciprocating movement upon actuation of said swingable arm, and a second spring element disposed between and interconnecting said braces, said second spring element being spaced from said pin, each of said braces being laterally inwardly depressible against the loading of said spring elements to disengage said shoulders from said abutments, said second spring element tending to urge said braces laterally outwardly to permit automatic operative engagement of said shoulders and said abutments upon extension of said swingable arm.

7. In a bracket assembly, a bracket arm of inverted channel section having side flanges and a bridging portion, a swingable arm of channel section having side flanges and a bridging portion, the side flanges of said swingable arm being pivotally connected to said side flanges of said bracket arm, a pair of spaced braces, a pivot pin connecting one end of each brace to the side flanges of said swingable arm, a compression spring element disposed around the pin, and engaging said braces, said spring element permitting laterally inward movement of said braces along said pin against the loading of said spring element, a guide strip connected to said bracket arm, the other end of each said brace being provided with an inturned tab, said tabs being retained between said guide strip and said bracket arm, an abutment extending inwardly of each side flange of said bracket arm, a second compression spring element disposed between and interconnecting said braces, said second spring element tending to urge said braces laterally outward against the side flanges of said bracket arm, each of said braces being provided with a shoulder adapted to engage one of said abutments to retain the swingable arm in an extended position, said braces being laterally inwardly depressible against the loading of said spring elements to disengage said shoulders and abutments.

8. In a bracket assembly, a bracket arm of inverted channel section having side flanges and a bridging portion, laterally projecting flanges on each end of said bracket arm adapted for attaching the bracket arm to the underside of a cabinet, a swingable arm of channel section having side flanges and a bridging portion, the side flanges of said swingable arm being pivotally connected to said side flanges of said bracket arm, a pair of spaced braces, a pivot pin connecting one end of each brace to the side flanges of said swingable arm, a spacer element between each of the braces and the adjacent side flange of the swingable arm, a compression spring element disposed about the pin, and engaging said braces, said spring element permitting laterally inward movement of said braces along said pin against the loading of said spring element, a guide strip connected to the underside of the bridging piece of said bracket arm, the other end of each said brace being provided with an inturned tab, said tabs being retained between said guide strip and said bridging piece of the bracket arm, an abutment extending inwardly of each side flange of said bracket arm, a second compression spring element disposed between and interconnecting said braces, and being considerably spaced from the first said spring element, said second spring element tending to urge said braces laterally outward against the side flanges of said bracket arm, each of said braces being provided with a shoulder adapted to engage one of said abutments to retain the swingable arm in an extended position, said braces being laterally inwardly depressible against the loading of said spring elements to disengage said shoulders from said abutments, and an adjustable means interconnecting the bracket arm and said swingable arm to limit the extension of said swingable arm.

References Cited in the file of this patent

UNITED STATES PATENTS

313,940	Kehoe	Mar. 17, 1885
1,406,468	McCullum	Feb. 14, 1922
1,407,877	Mott	Feb. 28, 1922
1,535,668	Jostedt	Apr. 28, 1925
1,705,203	Patterson	Mar. 12, 1929
1,776,198	Russ et al.	Sept. 16, 1930
2,271,332	Ellington	Jan. 27, 1942
2,273,854	Fitch	Feb. 24, 1942
2,309,180	Filonowicz	Jan. 26, 1943
2,636,707	Baker	Apr. 28, 1953

FOREIGN PATENTS

688,158	Great Britain	Feb. 25, 1953