

April 23, 1968

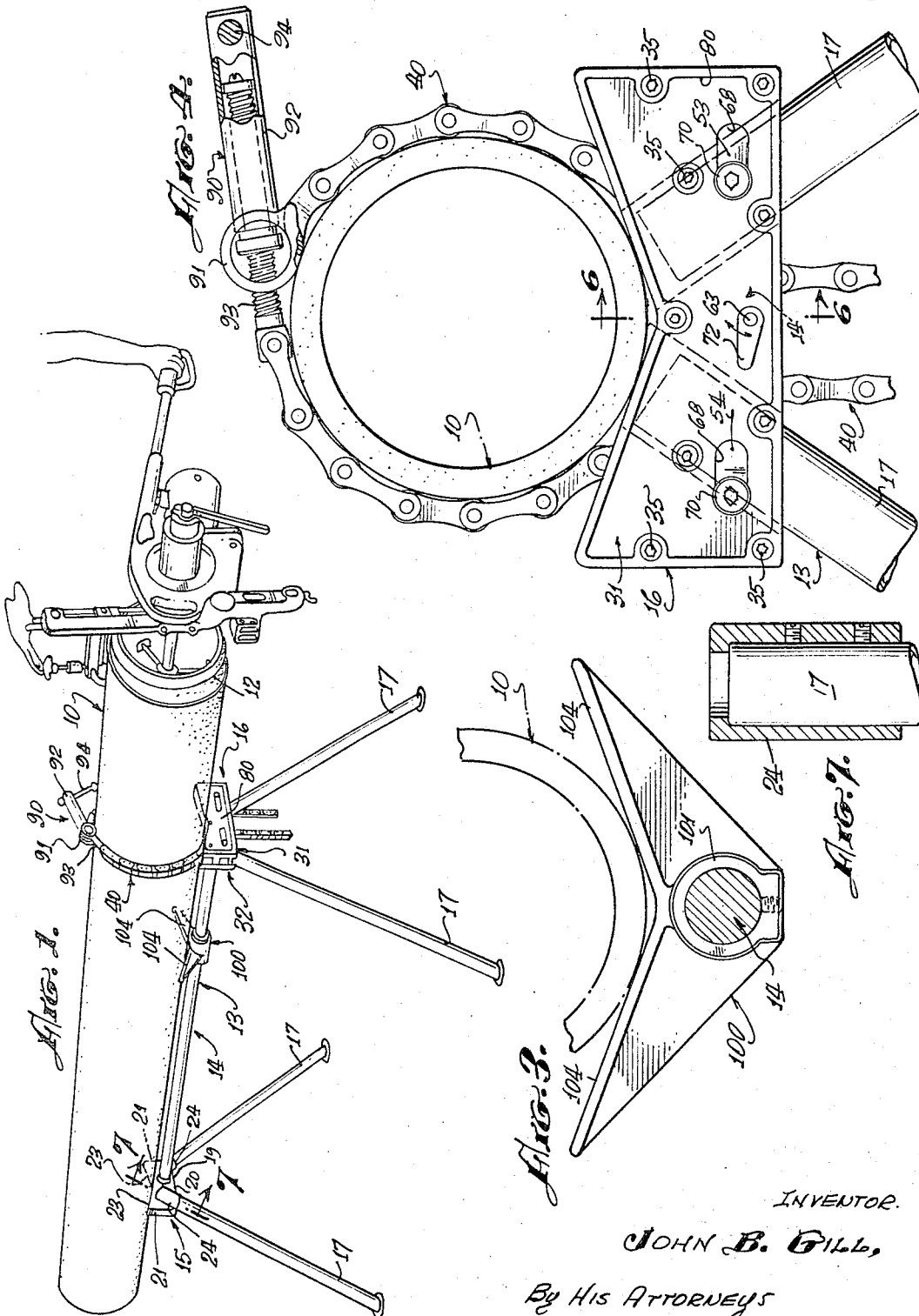
J. B. GILL

3,379,431

WORK HORSE

Filed Oct. 24, 1965

2 Sheets-Sheet 1



INVENTOR.

JOHN B. GILL

By His ATTORNEYS

Spensley & Horw.

April 23, 1968

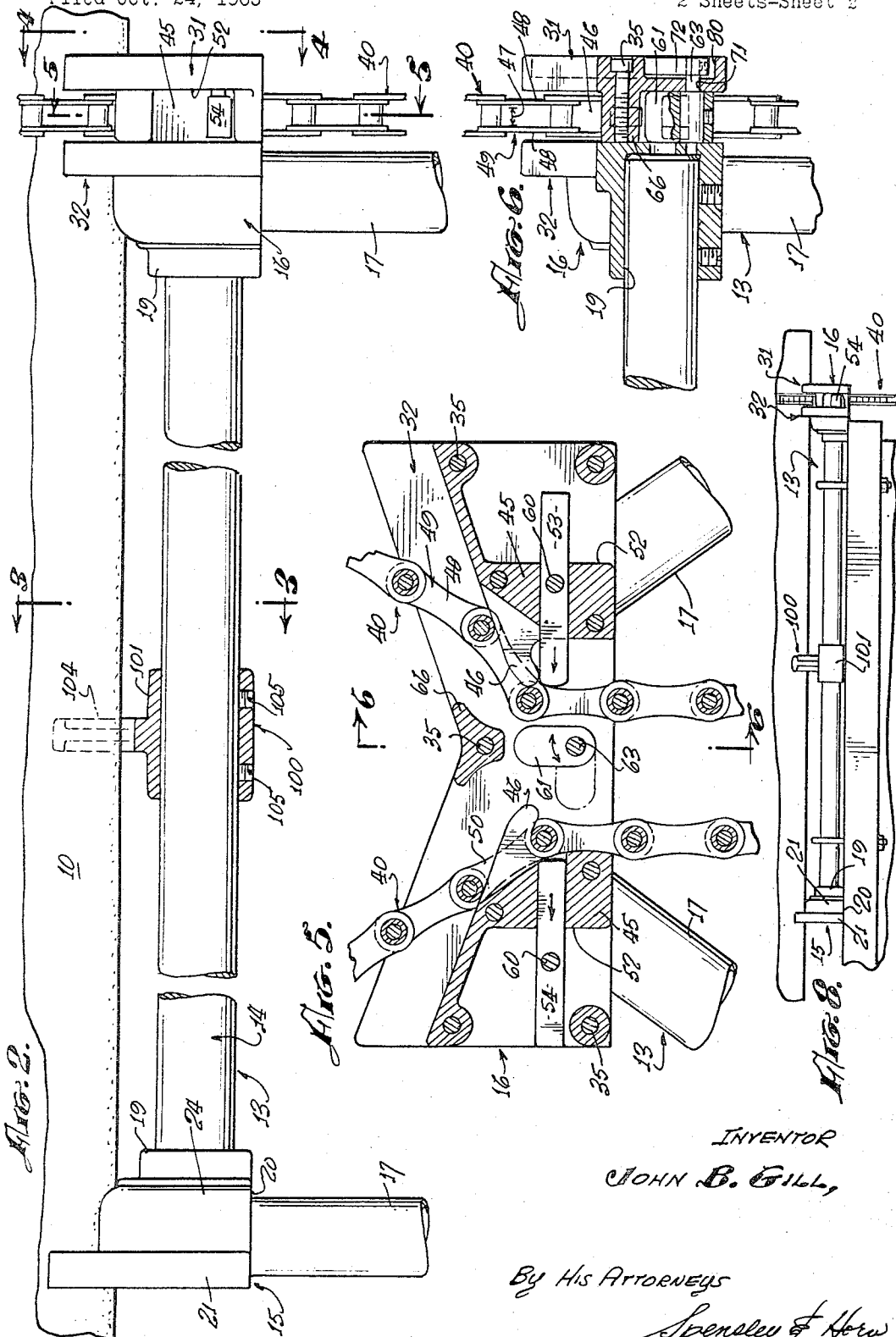
J. B. GILL

3,379,431

WORK HORSE

Filed Oct. 24, 1965

2 Sheets-Sheet 2



INVENTOR  
JOHN B. GILL,

By His Attorneys  
Spensley & How

1

3,379,431

WORK HORSE

John B. Gill, 2571 Via Campesina, Palos

Verdes Estates, Calif. 90274

Filed Oct. 24, 1965, Ser. No. 504,940

12 Claims. (Cl. 269-130)

This invention relates to improvements in a work horse kit and, more particularly, to a work horse kit employing a chain binder.

The term "work horse" is commonly applied to a saddle structure used for supporting a work piece such as a log, a piece of lumber, a pipe or the like in an elevated horizontal position to facilitate operations such as sawing, cutting, threading, machining and the like.

The work horse of the present invention is suitable for holding many different kinds of work pieces with cross sectional areas of widely different shapes and areas. The invention is particularly suitable for mounting relatively large diameter pipe such as asbestos cement, plastic or aluminum pipe, and accordingly, the invention will be described in relation to such pipe although it is to be expressly understood that the work horse is satisfactory for other work pieces as stated hereinabove.

The invention disclosed herein comprises a number of separable parts which are readily assembled in a convenient work horse and readily disassembled for easy storing and transporting. The invention includes a horizontal tube, commonly known as a strongback, a pair of saddle heads connected at the ends of the tube with a chain binding mechanism incorporated into one of the saddle heads. Two divergent legs are connected to each saddle head for firm and steady triangular support. A movable saddle head is provided intermediate the two end saddle heads to accommodate shorter work pieces on a fixed length work horse. The legs are removably affixed to the end saddle heads so that they may be easily removed to thus allow the strongback with the saddles to be placed on a table, bench or other flat surface.

The work horse according to the present invention is an improved version of the work horse which I earlier invented and which is the subject of U.S. Patent 2,989,142. The advantages and improvements of the present invention over those of U.S. Patent 2,989,142 lie primarily in the novel end saddle which has provided therein a chain binding means and in the intermediate saddle head which is movable along the strongback to provide accommodation of shorter work pieces with rapidity and convenience.

The novel features which are believed to be characteristic of the invention, both as to its organization and method of operation, together with further objects and advantages thereof will be better understood from the following description considered in connection with the accompanying drawing in which a presently preferred embodiment of the invention is illustrated by way of example. It is to be expressly understood, however, that the drawing is for the purpose of illustration and description only, and is not intended as a definition of the limits of the invention.

In the drawings:

FIG. 1 is a perspective view of a work horse constructed in accordance with this invention;

FIG. 2 is a fragmented side elevational view of the device shown in FIG. 1;

FIG. 3 is a view taken along line 3-3 of FIG. 2;

FIG. 4 is a view taken along line 4-4 of FIG. 2;

FIG. 5 is a view taken along line 5-5 of FIG. 2;

FIG. 6 is a view taken along line 6-6 of FIG. 5;

FIG. 7 is a view taken along line 7-7 of FIG. 1;

and,

FIG. 8 is a fragmented side elevational view showing

2

the device of FIG. 1 with the legs removed and the device placed on a flat surface for support.

Referring to the drawings, FIG. 1 shows a preferred embodiment of a work horse according to this invention in a perspective view.

The work piece is an asbestos cement pipe 10 of approximately ten inches outside diameter. The pipe 10 is being worked upon by a machining tool to provide a reduced diameter end 12 on the pipe 10 for coupling purposes. The forces involved in such operations are great and thus the work piece must be held rigidly. The work horse 13 of the present invention will hold pipes up to 28" and more in diameter with sufficient rigidity for all pipe operations.

The supporting function of the work horse 13 is provided by a strongback 14 carried by saddle heads 15 and 16. The saddle heads 15 and 16 are ground supported through legs 17.

The saddle head 15 comprises a central socket 19 adapted to slidably engage the end of the tubular strongback 14. The head 15 has a flat bottom 20 and vertical side walls 21 and a pair of angular surfaces 23 as a top surface for supporting the work piece. A pair of tubular sockets 24 are secured at the upper ends thereof by welding or other suitable means to the saddle head 15 and are diverging downwardly on opposite sides of central socket 19. The saddle head 15 in the preferred embodiment is made of metal but can be fabricated of any material with sufficient strength to hold the desired work pieces. The strongback 14 is slidably engaged into socket 19 and secured by welding or by set screws if it is desired to be able to separate the saddle heads and strongback for storage, although this has not been found to be necessary for most field operations, and it is considered desirable to have the saddle heads and strongback as one unit for maximum rigidity.

The legs 17 are tubular and slidably engage in the sockets 24 provided therefor. The legs 17 are held in sockets 24 by setscrews for rapid assembly and disassembly. Two setscrews are utilized in each socket for rigidity and to eliminate play of a leg 17 in the socket. The removably affixed legs are a particularly convenient feature when transporting the work horse in field use. The work horse with the removable legs can be readily stored or carried along the side of a truck when in a disassembled state. As can be best seen in FIGS. 4 and 8 the sockets 19 do not project below the bottom 20 of saddle head 15. Thus, when legs 17 are removed, the saddle head 15 may be rested on any flat surface. As will be described hereinafter, saddle head 16 also has this feature and thus the work horse can be utilized conveniently on a work bench or truck bed by the simple expedient of removing the legs. This is particularly useful for a field repair truck where the work horse without legs may be bolted or otherwise affixed to the rear of a truck bed for on-site repairs.

Saddle head 16 has incorporated therein chain binding means for chaining a work piece tightly to the work horse after the work piece is properly mounted on the saddle heads. Saddle head 16 is formed of two plate sections, a first section 31 and a second section 32. The second section 32 has on its side which faces strongback 14, sockets (not shown) like those of saddle head 15 to engage strongback 14 and legs 17. When the two sections 31 and 32 of head 16 are connected as by bolts 35 or other means, the assembly provides the same general configuration externally as in saddle head 15 and thus provides the saddle head for supporting pipe 10 at the end opposite the end supported by saddle head 15. On the side opposite from that facing strongback 14, the first section 31 of saddle head 16 has provided

thereon a novel structure for binding a chain 40 to provide a chain vise for holding the work pieces 10. The chain 40 is a chain which is of the type as used on bicycles, that is, having links with spaced apart sides so that a sprocket or finger can engage the link. Section 31 has connected thereon components 45 which are symmetrically placed laterally on section 31. Each of the components 45 provides a chain link engaging finger 46 facing inwardly. The finger 46 is arcuate and sloped downwardly. The width 47 of finger 46 is of predetermined size less than the spacing between sides 48 of a link 49 of chain 40. The width 47 is such that a link 49 may be captured as shown particularly by link 50 in FIG. 5. Slot cutouts 52 are provided in components 45 which are cooperatively fitted to slide bars 53 and 54. The width 55 of bars 53 and 54 is of a predetermined size greater than the spacing between sides 48 of a chain link 49. If the slide bar is at its most inward position as bar 53 in FIG. 5, it is clear that the links are "barred" from being captured by the fingers 46. If, however, the bar is at its most outward position as bar 54, then the chain link will be captured by the finger 46 as shown by link 50 in FIG. 5. Components 45 are made, in the preferred embodiment, of metal and are secured to section 31 by bolts. The shape of components 45 is not critical and any sufficiently strong configuration may be utilized; it is merely necessary to provide a properly located finger and slide bar.

Threaded studs 60 are provided on bars 53 and 54 to allow manual sliding of the bars. Also provided on section 31 is a pivoted member or dog 61 which is of sufficient length such that when in the down position as shown by the dotted line in FIG. 5, the chain 40 cannot release although both bars 53 and 54 are in their outermost positions. Threaded stud 63 is provided to permit manual pivoting of dog 61.

Section 31 is provided with bossed areas 66 which provide the proper spacing for clearing chain 40 when sections 31 and 32 are bolted together by bolts 35. Slots 68 are formed in section 31 to make the studs 60 accessible for sliding bars 53 and 54. The length of slots 68 are predetermined such that the slot 68 ends provide the correct limits for the travel of bars 53 and 54. Knobs 70 are threaded to studs 60 for ease of handling. An opening 71 is also provided to make stud 63 accessible. A knob 72 is threaded to stud 63 for ease of manual pivoting of dog 61. Section 31 has a recessed area 80 which is substantially over its entire surface. The area 80 is provided so that the knobs 70 and 72 will be recessed for attractive appearance and safety resulting from lack of external protuberances.

Chain 40 is provided with a screw feed mechanism 90 for tightening the chain after its links are captured at the desired chain length. At one end of chain 40 a retainer 91 is affixed. A tubular threaded feeding chamber 92 is rotatably affixed to retainer 91 so that by rotating 92, screw 93 will proceed inwardly or outwardly to tighten or loosen chain 40 around work piece 10. A handle 94 is provided to reduce the effort to turn chamber 92.

For a clearer understanding the operation of the chain device is desirable and will be explained. In operation, the work piece 10 is mounted on the saddle heads 15 and 16. The chain 40 for convenience prior to mounting pipe 10 is engaged on one side on component 45 so that the chain will not be separate from the work horse and perhaps be lost or difficult to locate. The other side of chain 40 will be unengaged and thus the chain with the screw feed assembly 90 is hanging loose to one side of the work horse. After pipe 10 is mounted the loose side of the chain 40 is dropped through saddle head 16 through the top opening thereof. The slide bar 53 is in its innermost position so that the chain 40 will drop beyond the bottom of saddle head 16. The end of the chain that is beyond head 16 is drawn by hand as tight as conveniently possible and the bar 53 is moved to its outermost posi-

tion. Thus, the chain will now be engaged on both sides by fingers 46 and the pipe 10 will be held upon the work horse. To hold pipe 10 in a vise like grip on the work horse so that machining operations may be performed, handle 94 is turned by hand until the chain 40 tightens up. Experimental models have been constructed and prove that pipes so held are capable of having any of the usual pipe operations performed thereon without turning or otherwise moving. Also for the reason that the chain 40 almost completely envelopes the work piece, the holding forces are distributed over a large area of the work piece and no great force is imposed at any single point. It has been found by applicant on his experimented models that large diameter thin wall plastic and aluminum pipes may be handled without significant distortion. Incorporating the chain binding mechanism into the saddle provides the most convenient chain handling system and provides the greatest support since the holding forces applied by the chain are exerted directly over the support saddle. This feature provides another significant advantage in that extremely short work pieces can be accommodated with the only limitation being the amount of purchase that can be attained by the chain 40.

A movable saddle head 100 is provided to accommodate work pieces shorter than the distance between the two end saddles 15 and 16. Saddle head 100 comprises a central tube 101 with an inside diameter substantially equal to but greater than that of strongback 14. The saddle head 100 is thus free to slide along strongback 14 to support a work piece at any desired location along the strongback 14. Connected to the tube 101 as by welding are two upwardly diverging wings 104 which provide a work piece supporting surface like that of the upper surfaces of saddle heads 15 and 16. The head 100 is retained in place by setscrews 105.

The work horse in its presently preferred embodiment is approximately 6 feet long. This length it has found will conveniently hold work pieces of 13 feet or more. The movable saddle head 100 allows a work piece of length less than 6 feet to be easily handled. It is to be noted that as discussed hereinabove, because of the novel chain binding mechanism, extremely short pieces can also be handled easily.

Thus, there has been described a novel work horse construction which is more suitable for use than prior art devices. The work horse comprises a strongback terminated by two end saddle heads. The saddle heads are adapted to receive removable legs which retain the strongback and saddle horses above ground level if desired. When the legs are removed, the saddle horses may be placed on any convenient flat surface. Incorporated in one of the saddle heads is a novel chain binder or vise which can be easily adjusted to accommodate work pieces of widely differing cross-sectional areas and shapes. Intermediate the end saddle heads, a third saddle head is movable along the strongback to accommodate extremely short work pieces.

Although this invention has been disclosed and illustrated with reference to particular applications, the principles involved are susceptible of numerous other applications which will be apparent to persons skilled in the art. The invention is, therefore, to be limited only as indicated by the scope of the appended claims.

What is claimed is:

1. A work horse comprising:

- (a) a strongback;
- (b) first and second saddles affixed to the ends of said strongback;
- (c) said first and second saddles being adapted for receiving support legs;
- (d) each of said saddles being adapted to have a work piece mounted thereon; and,
- (e) chain binding means for holding a work piece to said saddles, said chain binding means being cooperatively incorporated into said first saddle, and

5

said chain binding means comprising: first and second lengths of chains; screw feeding means for interconnecting said chain lengths; means for engaging links in the free ends of said chain lengths whereby work pieces may be held on said work horse; and means for barring said links from being engaged by said engaging means.

2. A work horse as claimed in claim 1 wherein said engaging means comprises downwardly disposed fingers and said barring means comprises a slidable bar, said bar sliding in a slot provided therefor in said first saddle.

3. A work horse as claimed in claim 1 wherein a third saddle is slidably engaged to said strongback and movable therealong between said first and second saddles.

4. A work horse as claimed in claim 2 wherein a third saddle is slidably engaged to said strongback and movable therealong between said first and second saddles.

5. A work horse comprising:

- (a) a strongback;
- (b) first and second saddles affixed to the ends of said strongback;
- (c) said first and second saddles being adapted for receiving support legs;
- (d) each of said saddles being adapted to having a work piece mounted thereon;
- (e) said first saddle comprising first and second spaced apart parallel sections, said sections being adapted to allow a chain to pass through the space between said sections;
- (f) finger means for engaging links of a chain passing through said first saddle;
- (g) sliding bar means for barring said chain links from being engaged by said finger means; and,
- (h) said finger means and said sliding bar means being fastened to said first section of said first saddle.

6. A work horse as claimed in claim 5 wherein said first section of said first saddle has a slot defined therein, said slot being adapted to retain and guide said sliding bar means.

7. A work horse as claimed in claim 5 wherein a third saddle is slidably engaged to said strongback and movable therealong between said first and second saddles.

8. A work horse as claimed in claim 6 wherein a third

6

saddle is slidably engaged to said strongback and movable therealong between said first and second saddles.

9. A chain binding means comprising:

- (a) a support;
- (b) first and second lengths of chains;
- (c) screw feeding means for interconnecting said chain lengths;
- (d) means for engaging links in the free ends of said chain lengths whereby a work piece may be held on said support; and,
- (e) means mounted on said support for barring said links from being engaged by said engaging means.

10. A chain binding means as claimed in claim 9 wherein said engaging means comprises downwardly disposed fingers and said barring means comprising a slidable bar, said bar sliding in a slot in said support.

11. A chain binding means comprising:

- (a) a saddle having first and second spaced apart parallel sections, said sections being adapted to allow a chain to pass through the space between said sections;
- (b) finger means for engaging links of a chain passing through said saddle;
- (c) sliding bar means for barring said chain links from being engaged by said finger means; and,
- (d) said finger means and said sliding bar means being fastened to said first section of said first saddle.

12. A chain binding means as claimed in claim 11 wherein said first saddle section has a slot defined therein, said slot being adapted to retain and guide said sliding bar means.

#### References Cited

##### UNITED STATES PATENTS

2,025,377	12/1935	Crannell	292—264
2,120,497	6/1938	Heinrich	269—130 X
2,989,142	6/1961	Gill	182—224

##### FOREIGN PATENTS

763,282	12/1956	Great Britain.
---------	---------	----------------

LESTER M. SWINGLE, *Primary Examiner.*