United States Patent

[11] **3,623,620**

[72] Inventor **Howard H. Vermette**
No. 7 143rd ST., Hammond, Ind. 46320

[21] Appl. No. **874,007**
[22] Filed **Nov. 4, 1969**
[45] Patented **Nov. 30, 1971**

[54] **DEVICE FOR ELEVATING AS WELL AS TIPPING OR TILTING DRUMS, BARRELS, CONTAINERS, AND THE LIKE**
20 Claims, 11 Drawing Figs.

[52] **U.S. Cl.** **214/313,** 214/652
[51] **Int. Cl.** **B60p 1/04**
[50] **Field of Search** 214/652, 653, 313; 294/88

[56] **References Cited**

UNITED STATES PATENTS

2,267,355	12/1941	Riper	214/313
2,754,018	7/1956	Schroeder	214/652
2,904,202	9/1959	Brady	214/653
3,147,872	9/1964	Olson	214/652
3,199,698	8/1965	Schuster	214/653
3,363,929	1/1968	Nelson	294/88
3,522,893	8/1970	Yokich	214/313

Primary Examiner—Albert J. Makay
Assistant Examiner—Lawrence J Oresky
Attorney—Max R. Kraus

ABSTRACT: A device for elevating, as well as for tipping or tilting drums, containers and the like for dumping the contents therefrom, which device includes an upright or post supported on a base and a carriage member slidable on the upright and operated by means of a winch which raises and lowers the carriage member on the upright. The carriage supports a rotatable pulley which carries article-gripping means for engaging the drum container or the like, the article-gripping means is hydraulically adjustable so that the drum or article may be tightly gripped during the elevation thereof and also during the tipping or the tilting thereof. The hydraulic gripping means is provided with a safety valve to prevent premature release of the drum or article gripped thereby.

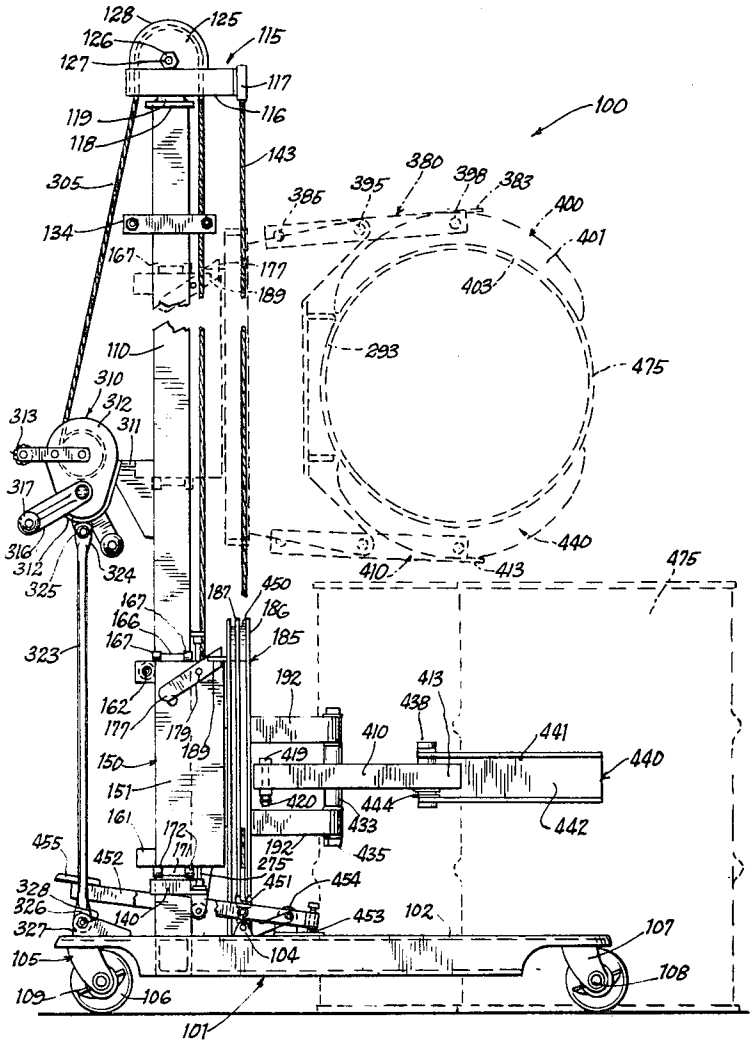
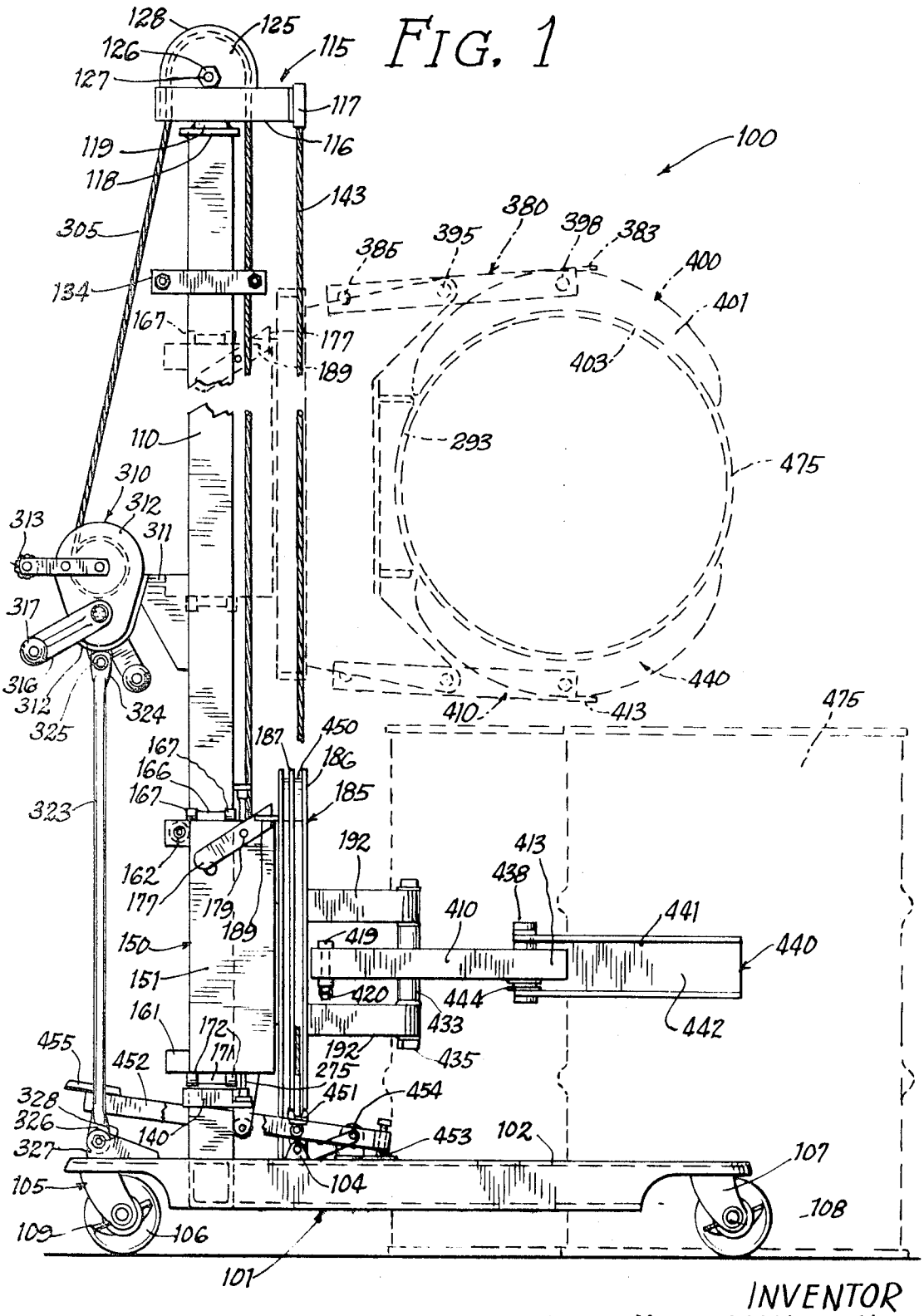


FIG. 1



INVENTOR
Howard H. Vermette
by Max R. Kraus
Att'y

FIG. 2

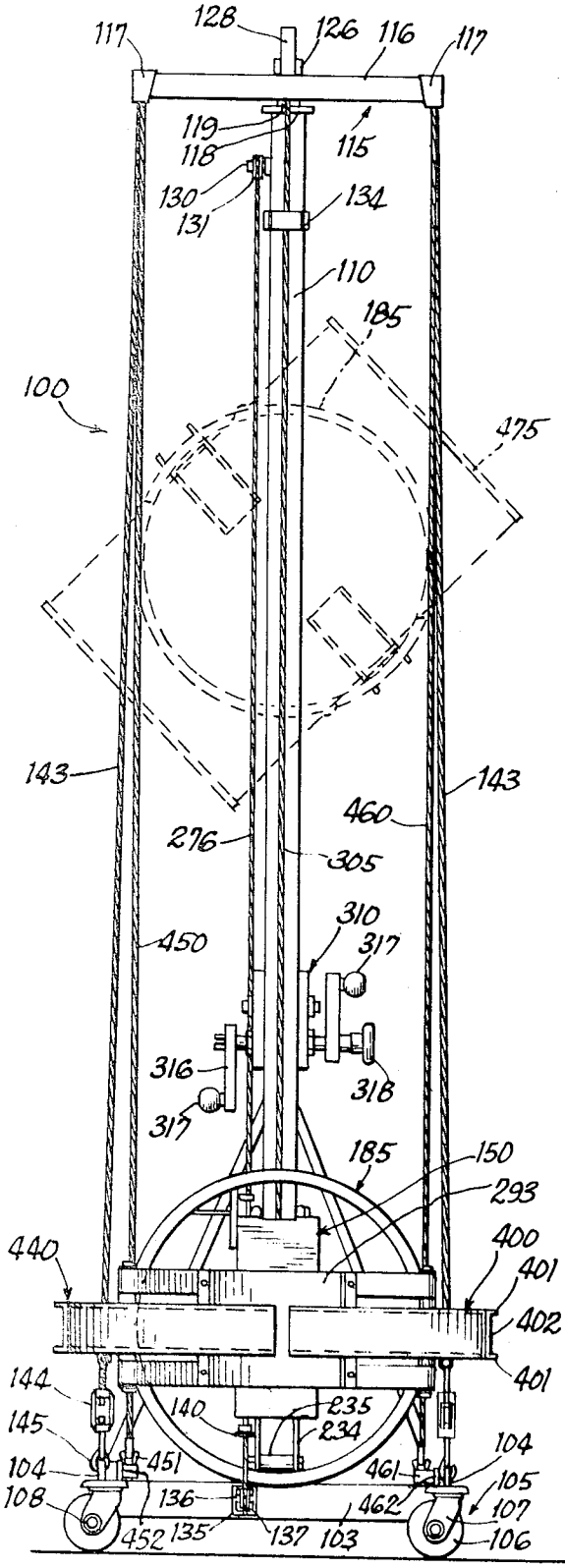

117
128
126
116
117
119
118
115
130
131
134
110
185
100
475
143
143
460
276
305
450
310
317
316
318
317
185
150
293
440
400
401
402
401
144
145
104
108
140
235
234
451
461
104
105
136
462
107
452
135
137
103
106

FIG. 3

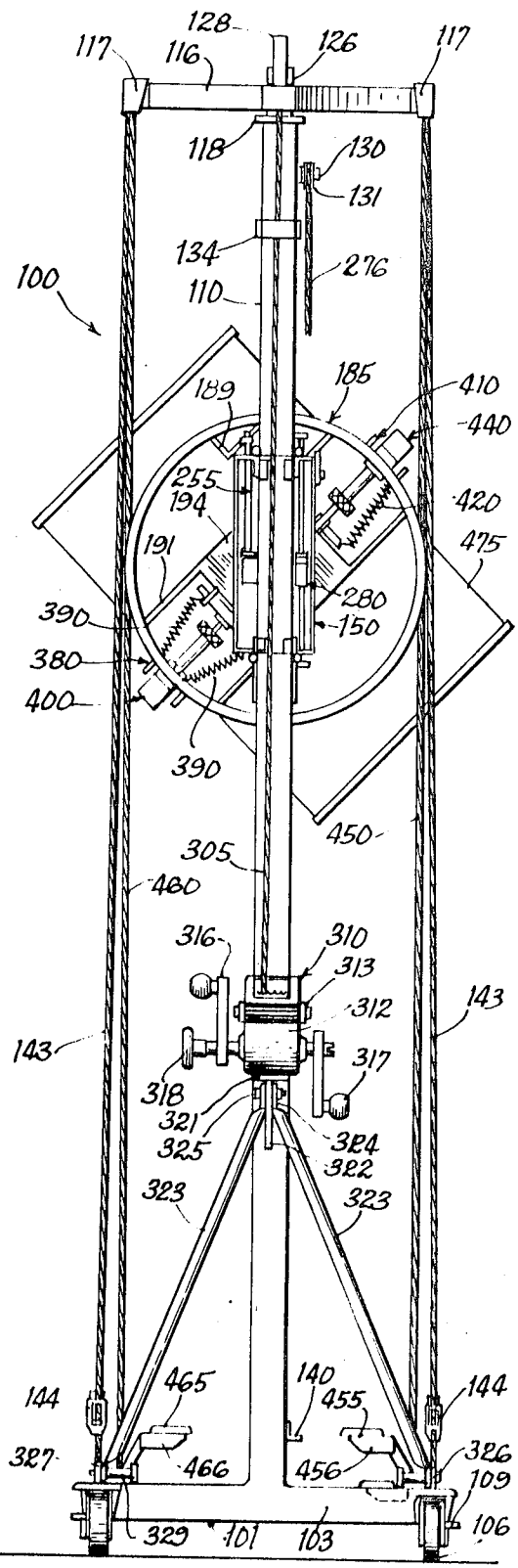

128
117
116
126
117
118
130
131
134
276
100
110
189
185
410
440
255
194
420
191
475
280
150
390
380
400
390
450
305
480
316
310
313
312
143
143
317
318
321
325
324
322
323
323
144
465
140
455
144
327
466
456
326
109
329
101
103
106

FIG. 4

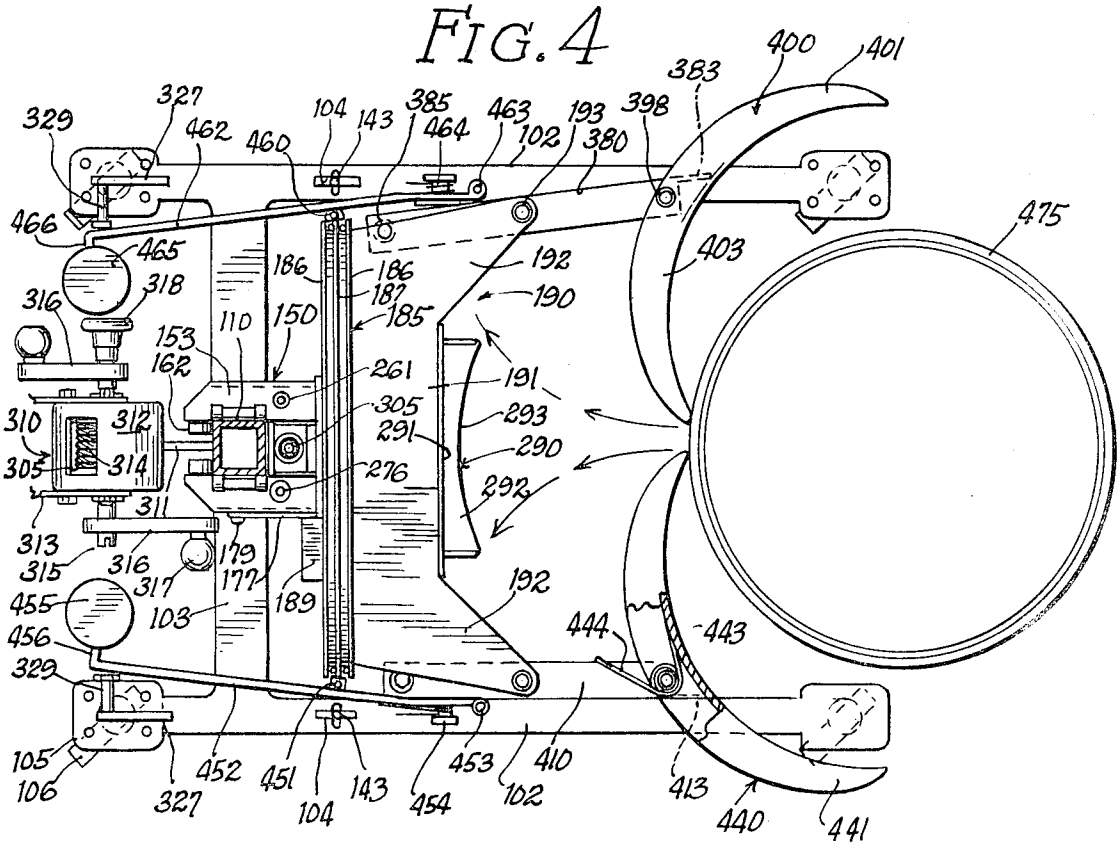

329
327
462
460
104
143
385
464
463
102
193
380
398
383
400
401
475
403
466
465
318
316
186
187
185
192
190
191
293
291
290
292
276
261
305
150
110
153
162
310
312
314
311
313
315
317
179
177
189
103
455
456
444
443
452
451
453
454
410
413
440
441
105
106

FIG. 5

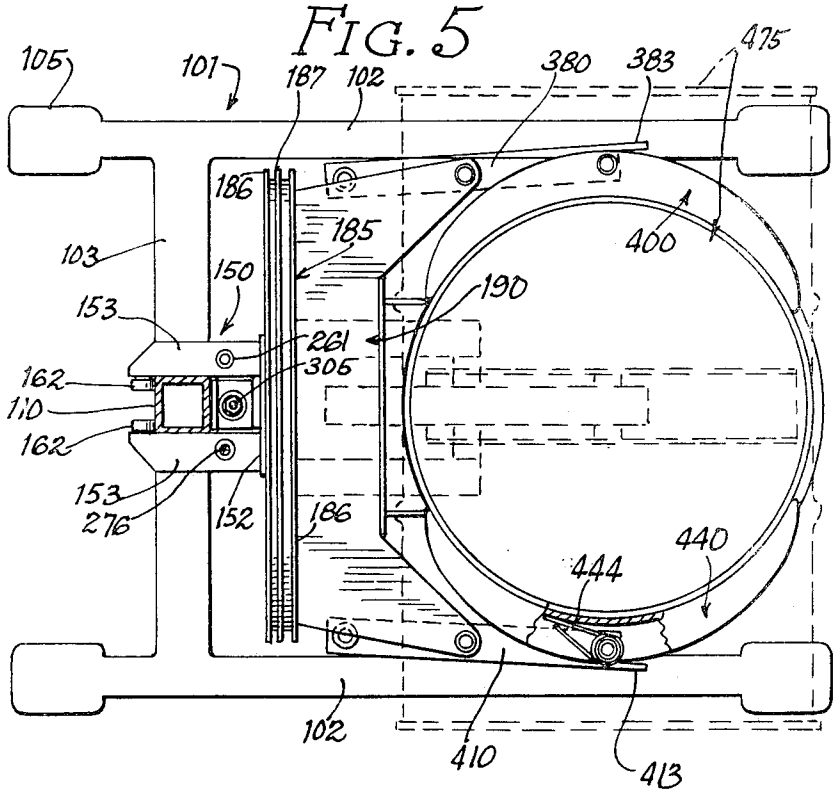

105
101
187
102
380
383
475
186
185
400
103
150
190
153
261
306
162
110
152
440
444
410
413

FIG. 6

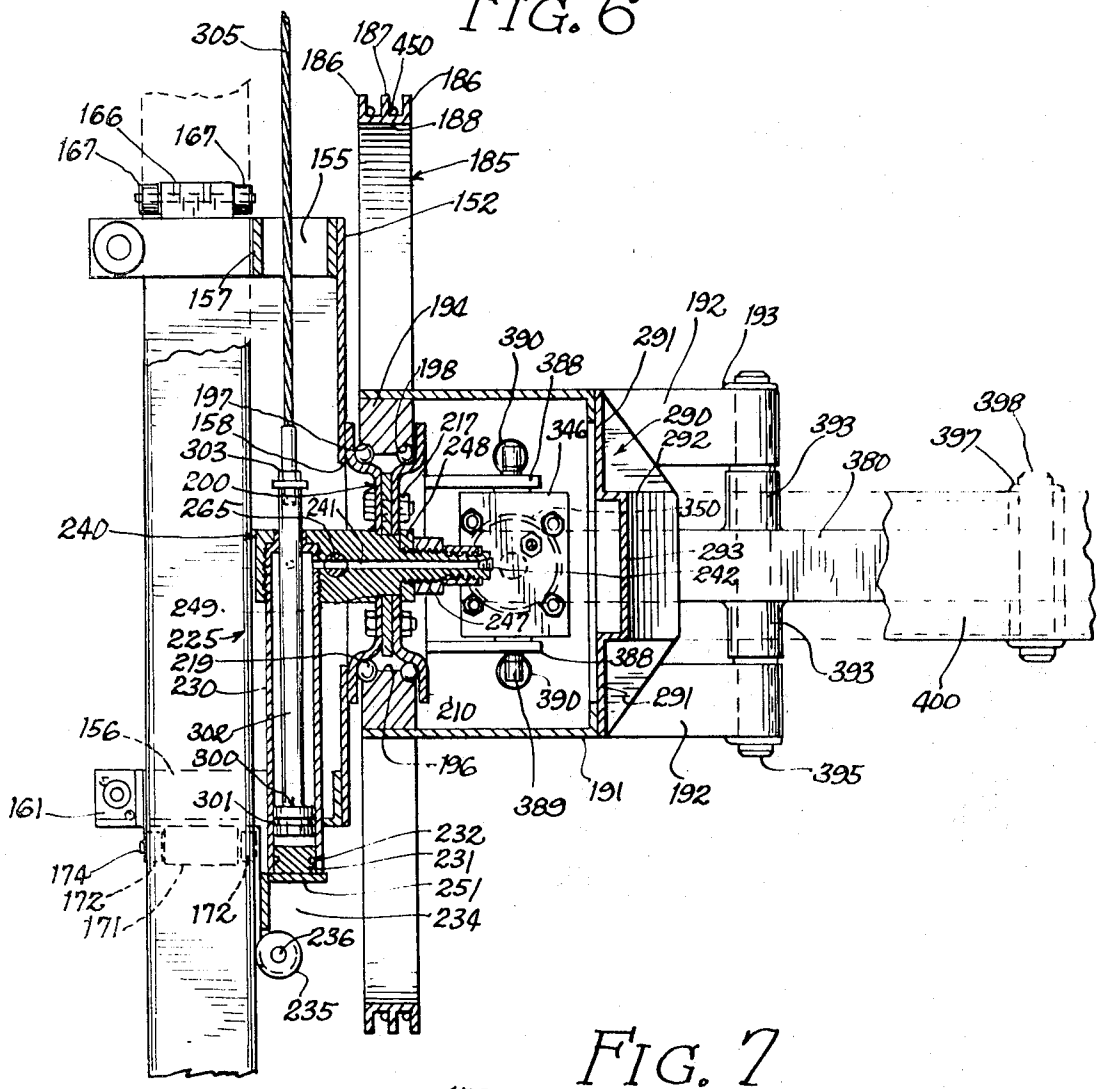
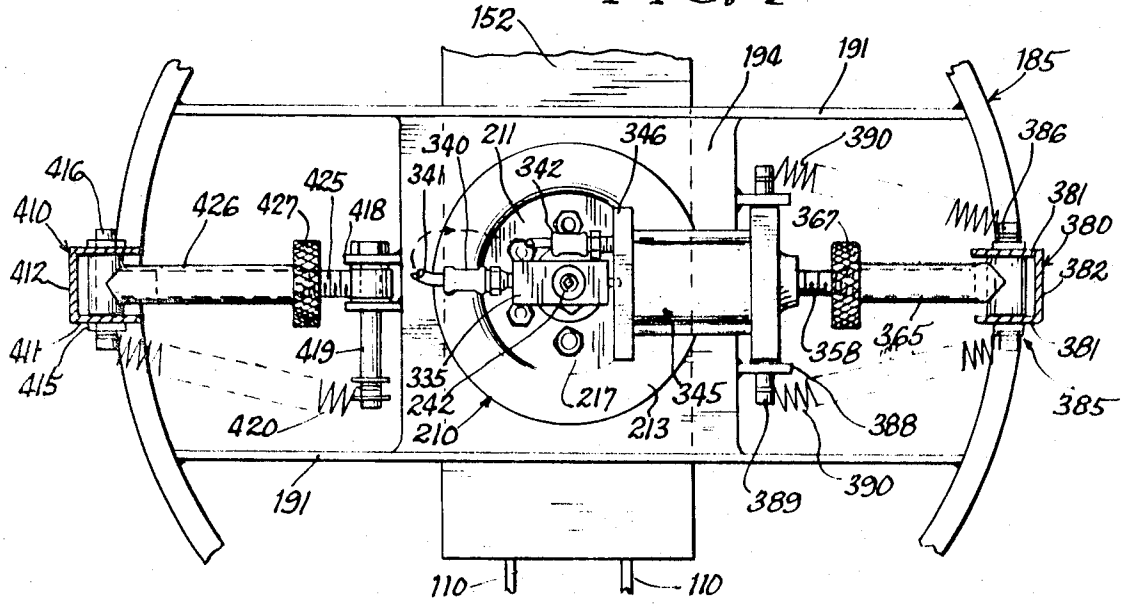

305
187
450
186
186
188
166
167
167
155
185
152
157
194
192
193
390
291
198
388
197
158
303
200
265
241
217
248
346
290
292
393
380
398
397
350
240
293
242
249
225
219
230
247
388
393
400
210
390
291
156
308
300
196
395
161
301
389
191
192
232
231
251
174
172
172
171
234
236
235

FIG. 7


152
194
191
185
340
211
346
390
386
416
341
342
381
410
426
427
425
418
367
380
412
382
419
358
365
381
411
415
335
242
217
345
213
388
385
420
210
191
389
390
110
110

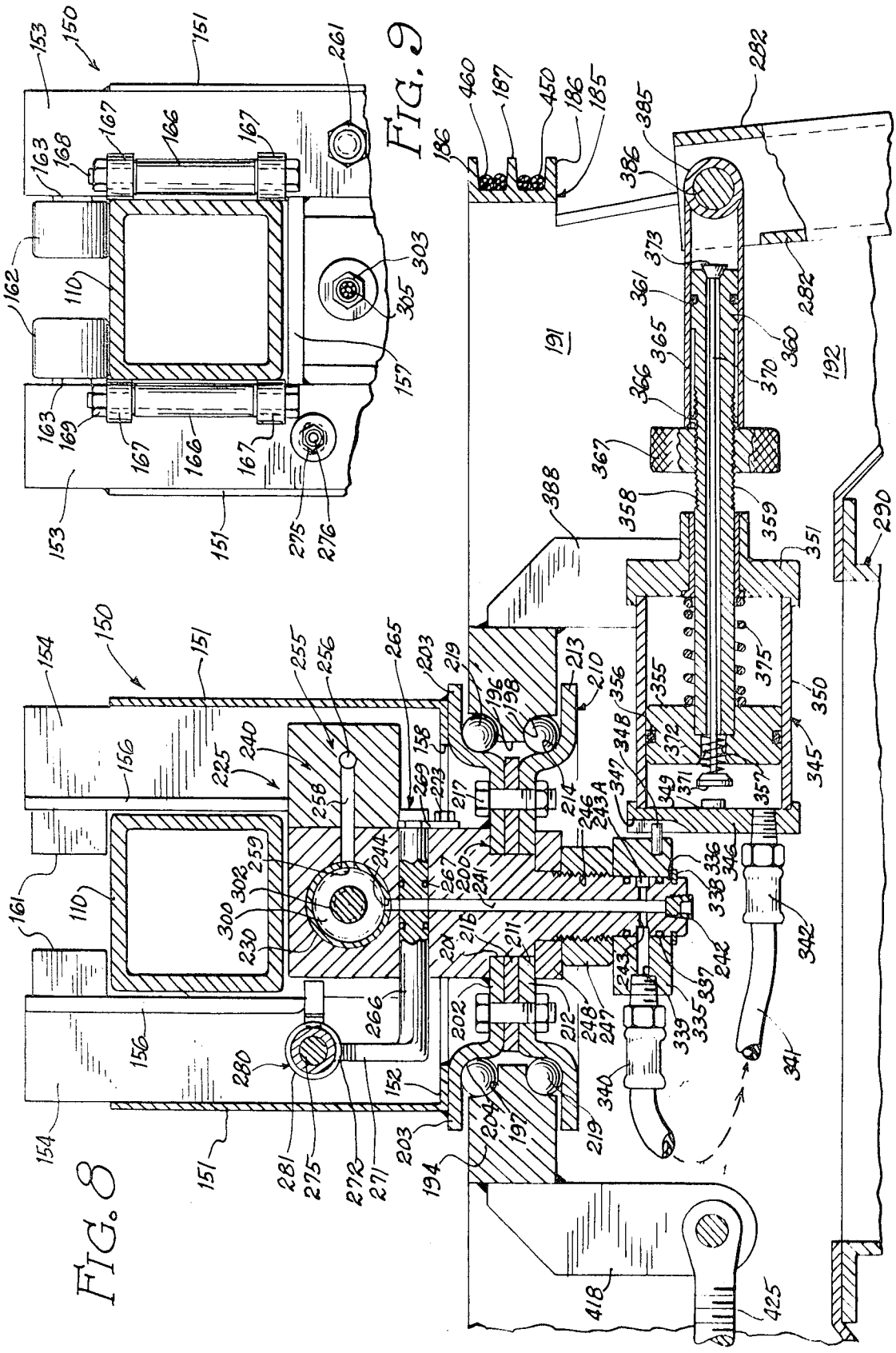


FIG. 8

FIG. 9

FIG. 10

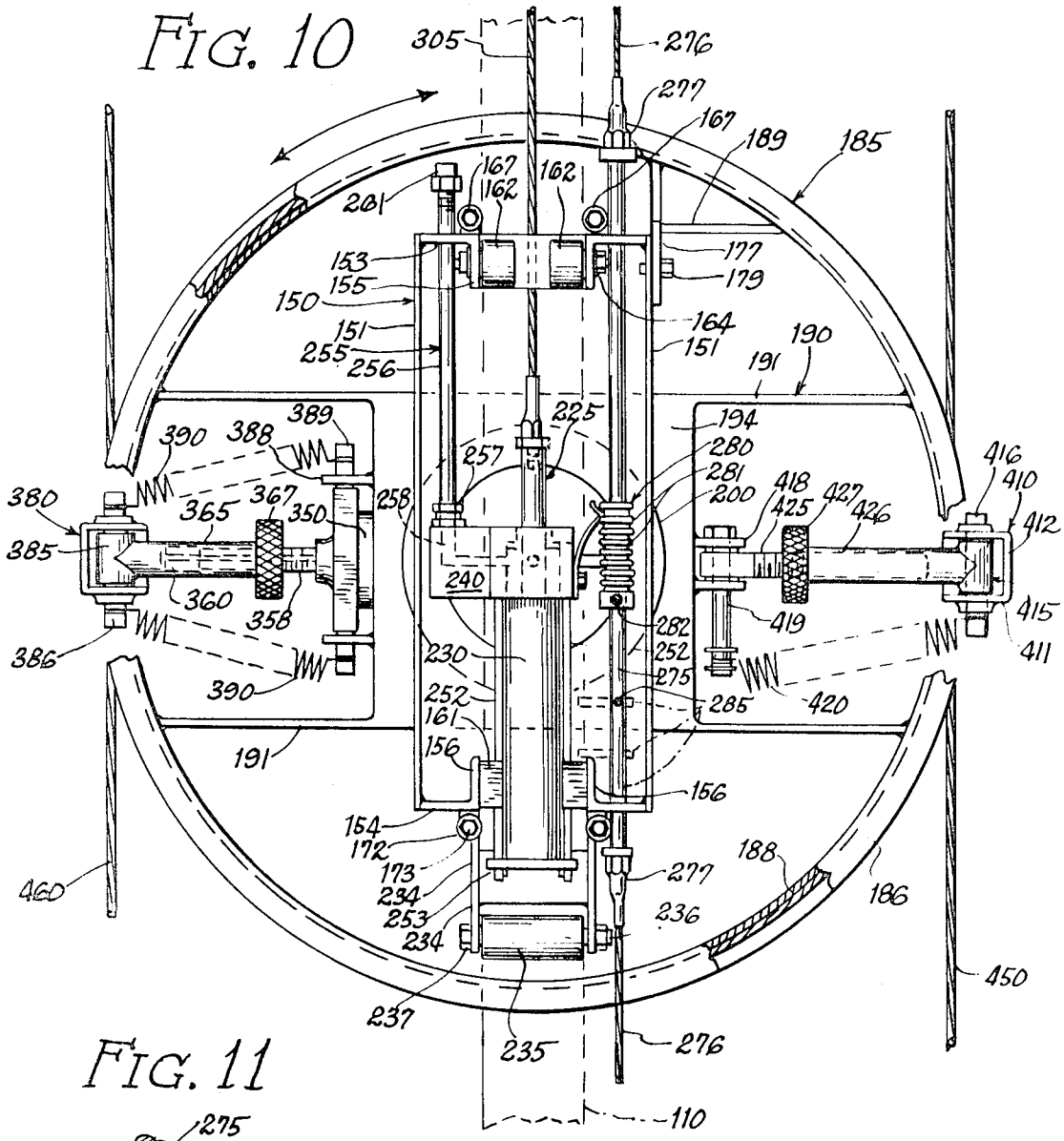
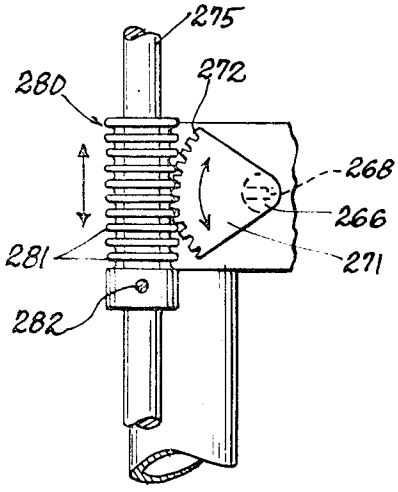

305
276
277
167
189
185
201
167
162
162
153
155
150
151
255
256
177
179
164
151
190
191
225
194
280
281
200
257
418
425
427
426
416
410
412
415
411
380
385
365
367
350
258
389
390
388
360
358
386
390
240
230
252
161
156
282
252
275
285
420
419
191
156
154
172
173
234
253
234
237
235
277
236
188
186
450
460
276
110

FIG. 11


275
272
280
268
266
271
281
282

DEVICE FOR ELEVATING AS WELL AS TIPPING OR TILTING DRUMS, BARRELS, CONTAINERS, AND THE LIKE

This is an improvement over my copending application, Ser. No. 760,767 filed on Sept. 19, 1968 for a DEVICE FOR ELEVATING, AS WELL AS TIPPING OR TILTING DRUMS, BARRELS, CONTAINERS, AND THE LIKE TO DUMP THE CONTENTS THEREFROM, the application therein being incorporated herein by reference.

BRIEF SUMMARY OF THE INVENTION

A principal object of the present invention is to provide a device for lifting and tilting or tipping articles, the device comprising a base, an upright supported on the base, a carriage member slidable on the upright for up and down sliding movement therealong, an article-gripping member connected to the carriage, the gripping member being hydraulically adjustable securely to grip the article, motor mechanism connected to the carriage for raising and lowering the carriage and the article-gripping member and means for tilting or tipping the article-gripping member and the article gripped thereby.

Another object of this invention is to provide a device of the type set forth in which the article-gripping member includes two jaws pivotable between a drum-receiving position and a drum-gripping position and hydraulic motor means for moving at least one of the jaws into the drum-gripping position, thereby securely to grip and substantially to encircle the drum.

A further object of the present invention is to provide a device of the type set forth in which a safety valve is associated with the hydraulic motor means for preventing premature release of the jaws from the drum-gripping position, thereby to prevent unintentional release of the drum when the drum is elevated off of the ground.

A still further object of the present invention is to provide a device of the type set forth in which one of the jaws is pivotable between a drum-receiving position and a drum-gripping position and is mounted on a movable arm, and the other jaw is pivotable between a drum-receiving position and a drum-gripping position and is mounted on a fixed arm, both of the arms being mounted on the carriage member and adapted for up and down sliding movement therewith along the upright.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof, will best be understood by reference to the following specification taken in connection with the accompanying drawings in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of the device of this invention showing a drum positioned on the ground ready to be gripped and a phantom view of the drum elevated above the ground and rotated 90° from the vertical;

FIG. 2 is a front elevational view with the jaws in a drum-receiving position and a phantom view of the drum gripped by the jaws and rotated about 45° from the vertical;

FIG. 3 is a rear elevational view particularly showing the spring biasing arrangement for the arms;

FIG. 4 is a plan view showing the jaws in the drum-receiving position;

FIG. 5 is a plan view showing the jaws in the drum-gripping position and a phantom view showing the drum rotated 90° from the vertical;

FIG. 6 is a side view partly in section particularly showing the hydraulic system in relation to the carriage;

FIG. 7 is a front elevational view of the hydraulic system;

FIG. 8 is a top view partly in section particularly showing the hydraulic system in relation to the upright;

FIG. 9 is a top view partly in section showing the roller means disposed about the central upright;

FIG. 10 is a rear elevational view of the large pulley and the associated hydraulic system; and

FIG. 11 is an enlarged elevational view of activating mechanism for the control valve.

The device **100** for lifting and tipping or tilting articles includes a carriage **150** adapted to slide up and down an upright **110**, the carriage **150** carrying thereon a pulley **185** adapted for rotational movement with respect to the carriage **150**, the pulley **185** and the carriage **150** carrying a hydraulic system **225** for controlling two arms **380** and **410**, the arm **380** being movable between an article-gripping position and an article-receiving position, the arms **380** and **410** carrying at the respective ends thereof and pivotable therewith a jaw **400** and a jaw **440** respectively, each jaw being pivotable between an article-receiving position and an article-gripping position.

Referring now to FIGS. **1**, **4** and **5**, the device **100** further includes two spaced-apart parallel legs **102** interconnected by a crosspiece **103**, the legs **102** and the crosspiece **103** being formed of hollow square-shaped members, the legs **102** forward of the crosspiece **103**, to the right as viewed in FIG. **4**, defining therebetween a space for receiving an article. Disposed on the top of each leg **102** at a point slightly forward of the crosspiece **103** is an eyelet **104**, each of the eyelets **104** being for a purpose hereinafter explained; the legs **102** are further provided with at each end thereof caster assemblies **105** for moving the device **100** from place to place, the caster assemblies **105** each include a wheel **106** housed within a U-shaped carrier **107**, the wheels **106** each being rotatably mounted on an axle **108** suitably journaled in the U-shaped carriers **107**, the caster assemblies **105** further including a wheel lock **109** for locking the wheels **106** thereby to prevent movement of the device **100**.

The device **100** also includes an upright **110**, the upright **110** being suitably secured substantially to the middle of the crosspiece **103**, such as by welding, and extending upward vertically therefrom, the upright **110** being hollow and square-shaped in cross section and formed of telescoping and interlocking sections. At the top of the upright **110** there is provided an outrigger **115**, the outrigger **115** being suitably secured to the upright **110**, such as by welding, the outrigger **115** including two boomerang-shaped arms **116** extending generally parallel to the crosspiece **103** of the base **101**, each of the arms **116** having at the outer end thereof a cable grip **117**, the outrigger **115** and cable grip **117** all for a purpose hereinafter to be explained. Interconnecting the upper end of the upright **110** and the outrigger **115** is a collar **118** and extension member **119**, the extension member **119** extending vertically from the collar **118** coaxially with the upright **110**.

Connected to the extension member **119** is a small pulley **125** rotatably mounted on an axle **126**, the axle **126** extending through a suitable aperture in the extension member **119** and being fastened therein by nuts **127**, and a pulley cover **128** is positioned over the pulley **125** to protect the pulley **125** and to maintain thereon the associated cable, as hereinafter explained. Extending transversely of the upright **110** below the collar **118** to the left, as seen in FIG. **2**, is a stub shaft **130**, the stub shaft **130** supporting for rotation thereabout a pulley **131**. Disposed below the pulley **131** around the upright **110** is a valve-release bracket **134**, the valve-release bracket **134** being clamped to the upright **110** and adapted for longitudinal movement therealong.

As seen in FIG. **2**, secured to the crosspiece **103** of the base **101** adjacent to the upright **110** is a pulley bracket **135** having mounted therein an axle **136** for supporting a pulley **137**, the pulley **137** being rotatably mounted on the axle **136**, the pulley **137** being in vertical alignment with the pulley **131**, all for a purpose hereinafter explained. The upright **110** is further provided at the bottom thereof with a stop plate **140**, the stop plate **140** being L-shaped and being suitably secured such as by clamping to the upright **110**. There also are provided two cables **143**, each connecting one of the cable grips **117** at the outer ends of the boomerang-shaped arms **116** with the respective one of the eyelets **104** by means of a hook **105** and turnbuckle **144**, the turnbuckle **144** serving to connect the hook **145** disposed in the eyelet **104** with the cable **143** and providing for adjustment of the length thereof, the cables **143** to provide stability to the device **100** against tipping thereof and also to provide support for the upright **110**.

The device 100 is further provided with a carriage 150 for up and down sliding movement along the upright 110, the carriage 150 including, as best seen in FIGS. 5, 8 and 10, two longitudinally extending spaced-apart side plates 151 interconnected by a front plate 152 having therein a central aperture 158, the sideplates 151 have at the top edge thereof and integral therewith inwardly extending top flanges 153 and also the sideplates 151 each have at the bottom edge thereof and integral therewith inwardly extending bottom flange 154. The top flanges 153 and the bottom flanges 154 are parallel and generally transverse to the longitudinal axis of upright 110. The top flanges 153 each have on the inner edge thereof a downwardly extending abutment flange 155, the abutment flange 155 being spaced apart a distance slightly greater than a side of the upright 110. The bottom flanges 154 each have on the inner edge thereof an upwardly extending abutment flange 156, the abutment flange 156 being spaced apart the same distance as the abutment flanges 155, all to facilitate sliding movement of the carriage 150 along the upright 110. The carriage is further provided with a plate guide 157 extending between the sidewalls 151 and abutting the top flanges 153, the plate guide being spaced at a predetermined distance from the rear of the carriage 150 to position the carriage 150 about the upright 110.

The carriage 150 is further provided with two guide blocks 161 suitably attached to the abutment flanges 156 and two top guide rollers 162 each suitably supported on a stub shaft 163 connected by fasteners 164 to an associated one of the abutment flanges 155. The carriage 150 is further provided with two circular flanges 166, each suitably secured to a respective one of the top flanges 153, the circular flanges 166 each supporting therein a top side roller 167 rotatably mounted on an axle 168 and fixed against lateral movement therealong by suitable fasteners 169. The top guide rollers 162 and the top side rollers 167 facilitating the up and down sliding movement of the carriage 150 of the upright 110, the plate guide 157 and the guide blocks 161 providing for alignment and positioning of the carriage 150 on the upright 110. There are also provided two spaced-apart circular bottom flanges 171, each suitably secured to a respective one of the bottom flanges 154, the circular flanges 171 each supporting therein a bottom side roller 172 rotatably mounted on an axle 173 and fixed against lateral movement therealong by suitable fasteners 174. The bottom side rollers 172 each facilitating the up and down sliding movement of the carriage 150 along the upright 110. There is also connected to he carriage 150 on the exterior of the right-hand sideplate 151, as seen in FIG. 1, a stop plate 177 pivotally supported by a fastener 179, the stop plate 177 being pivotable into and out of an operative position, all for a purpose hereinafter explained.

The device 100 is further provided with a pulley 185 for providing tilting or tipping action, the pulley 185 is generally in the form of a wheel rim, the rim being channel-shaped in cross section and having two spaced-apart upstanding sidewalls 186 and an upstanding flange 187 disposed therebetween, the sidewalls 186 and upstanding flange 187 are interconnected by a bottom wall 188, the sidewalls 186, flange 187 and bottom wall 188 cooperating to form two channels to accommodate tipping or tilting as hereinafter illustrated. Extending outwardly from the pulley 185 is a stop member 189, as seen in FIGS. 1 and 4, the stop member 189 extending transversely to the plane of the pulley 185 and contracting the stop plate 177 when the stop plate is in its operative position, the stop member 189 and stop plate 177 cooperating to position the pulley 185 in a predetermined angular position, as later explained.

The pulley 185 is further provided with a support frame 190, as best seen in FIGS. 4 to 7, the support frame 190 being H-shaped and having two parallel spaced-apart plates 191 extending forward of the pulley 185, each of the plates 191 forming a chord of the circle defined by the pulley 185, and each of the plates 191 being suitably secured to the pulley 185 such as by welding. Each of the spaced-apart plates 191 have on the outer ends thereof outwardly extending attachment portions or arms 192, each plate 191 having two arms 192 extending forwardly and diagonally outwardly of the pulley 185, each arm 192 having an aperture 193 at the outermost end thereof. The spaced-apart plates 191 of the support frame 190 have a crosspiece 194 transversely disposed with respect to the plates 191 and interconnecting the rear edges of the plates 191, the crosspiece 194 having a substantial thickness compared to the plates 191. The crosspiece 194 has therein an aperture 196, the aperture 196 being formed at the center of the crosspiece 194 and having the inner corners of the crosspiece 194 forming the aPerture 196 beveled to form arcuate edges respectively forming an outer ball race 197 and an inner ball race 198, the outer ball race 197 and the inner ball race 198, being for a purpose hereinafter explained.

Interconnecting the front edges of the plates 191 is a drum support 290, the support 290 being transversely disposed with respect to the spaced-apart plates 191, and including a transversely disposed attachment plate 291 having an offset central portion 292 formed into an arcuate surface 293, the drum support 290 serving to connect the plates 191 and also being for a purpose hereinafter explained.

Referring to FIGS. 6 and 8, associated with the pulley 185 is an inner annular plate 200, the inner annular plate 200 having therein an aperture 201 and surrounding the aperture 201 a flat central portion 202, the plate 200 further including an offset portion 203 suitably connected to the sideplates 151 and front plate 152 of the carriage 150, such as by welding, and extending beyond the sideplates 151, as also seen in FIG. 10, the offset portion 203 of the inner annular plate 200 being in registry with the aperture 158 in the front plate 152 of the carriage 150. The offset portion 203 of the inner annular plate 200 forms with the flat central portion 202 an inner ball race 204, the inner ball race 204 cooperating with the outer ball race 197 of the crosspiece 194 as hereinafter explained.

There is further provided an outer annular plate 210 associated with the pulley 185, the outer annular plate 210 having therein an aperture 211 and surrounding the aperture 211 a flat central portion 212, the plate 210 further including an offset portion 213, the offset portion 213 being spaced outwardly from the flat portion 212 and forming with the flat portion 212 outer ball races 214. The aperture 211 of the outer annular plate 210 is in registry with the aperture 201 of the inner annular plate 200 and the aperture 158 of the front plate 152 of the carriage 150. A flat annular plate 216 is disposed between the inner annular plate 200 and the outer annular plate 210 and connected thereto with suitable nuts and bolts 217 passing through appropriate apertures in the plates 200, 210, and 216. There are a plurality of ball bearings 219 disposed between the outer ball race 197 of the crosspiece 194 and the inner ball race 204 of the inner annular plate 200 and also disposed between the inner ball race 198 of the crosspiece 194 and the outer ball race 124 of the outer annular plate 210, thereby to provide rotational movement of the pulley 185 with respect to the carriage 150, it being seen that the annular plates 200 and 210 are fixed against rotational movement with respect to the carriage 150 but the pulley 185 is free to move thereabout.

There is also shown, as seen in FIGS. 6 to 8 and 10, a hydraulic system 225, the hydraulic system 225 including a vertically disposed, nonrotatably cylinder 230 positioned between the front plate 152 of the carriage 150 and the upright 110. The cylinder 230 has therein a bottom block 231 for sealing the bottom of the cylinder 230 and carrying therein an O-ring 232, thereby to prevent escape of hydraulic fluid from the cylinder. The cylinder 230 and the bottom block 231 rest on a bottom plate 251 which has connected thereto two spaced-apart vertically downwardly extending flanges 234 housing therebetween a roller 235 rotatably mounted on an axle 236 suitably connected to the flanges 234 and secured against axial movement by suitable fasteners 237.

The hydraulic system 225 further includes a housing 240 through which the fluids from the cylinder 230 are transmitted, the cylinder being connected to the housing 240 by

two tie rods 252 extending from the bottom plate 251 of the housing 240, the tie rods 252 are fastened by nuts 253. The housing 240 extends transversely of the cylinder 230 and is rectangular in cross section rearward of the inner annular plate 200 but circular in cross section forward of the plate 200, the housing 240 having an aperture 241 extending centrally thereof and having a plug 242 at the terminal end of the aperture 241 to prevent the escape of hydraulic fluid therefrom. The housing 240 has at the distal end thereof from the cylinder 230 a cross aperture 243, the cross-aperture 243 being transverse to the central aperture 241 and interconnected therewith. The cross-aperture 243 extends completely through the housing 240 which here is circular in cross section and terminates in a circular groove 243A extending completely around the periphery of the housing 240.

The housing 240 also has a threaded portion 246 spaced about the periphery thereof intermediate the aperture 243 and the outer annular plate 210 for cooperation with a nut 247 and a washer 248, the washer 248 being positioned between the nut 247 and the outer annular plate 210 to facilitate rotation of the pulley 185 and the parts carried thereby with respect to the housing 240. The housing 240 is further provided with offset portions 249 abutting the inner annular plate 200 and is suitably secured thereto such as by welding, thereby to prevent rotation of the inner annular plate 200 and the outer annular plate 210 upon rotation of the pulley 185.

An oil feed assembly 255 includes a vertical pipe 256 spaced from and to the side of the cylinder 230, the pipe 256 being suitably connected to the housing 240 and sealed against leakage therefrom by seals 257, a passageway 258 provides communication between the pipe 256 and the cylinder 230, the passageway 258 being in registry with an aperture 259 in the cylinder 230, thereby to provide communication between the oil feed assembly 255 and the cylinder 230, the oil feed assembly 255 being further provided with a cap 261 adapted to fit over the pipe 256 to prevent leakage of hydraulic fluid therefrom.

As particularly seen in FIG. 8, the hydraulic system 225 further includes a safety valve 265, the valve 265 comprising a rod 266 passing through the housing 240 having a square cross section intermediate the cylinder 230 and the inner annular plate 200, the valve 265 including two spaced-apart O-rings 267 for preventing the escape of hydraulic fluid through the housing 240, the rod 266 having an aperture 268 extending transversely therethrough, the aperture 268 being so positioned in the rod 266 to complete the passageway between the cylinder 230 and the central aperture 241 in the housing 240 when the valve 265 is in the operative position. When the valve 265 is out of the operative position, the aperture 168 is moved or rotated from registry with the aperture 241 in the housing 240 to prevent hydraulic fluid from passing through the valve 265 and thereby from passing between the cylinder 230 and the housing 240.

The valve 265 further includes an attachment plate 269 and nut therefor for maintaining the rod 266 within the housing 240 and on the opposite end of the rod 266 within the housing 240 and on the opposite end of the rod 266 a gear segment 271, as particularly seen in FIG. 11, the gear segment 271 being in the form of a pie-shaped member having on the distal end thereof a plurality of gear teeth 272, the gear segment 271 being suitably secured to the valve 265 by means of a bolt 273, see also FIG. 10. The valve 265 is associated with a shaft 275 positioned on a pull cord 276, the cord 276 extending upwardly and downwardly to form an endless belt over the associated pulleys 131 and 137, the pull cord being connected by fasteners 277 to the shaft 275. The shaft 275 carries thereon a cylindrical member 280, the cylindrical member 280 having thereon and thereabout circular flanges 281 longitudinally spaced apart, the cylindrical member 280 being fixedly secured to the shaft 275 by means of setscrews 282, the gear segment 271 and the member 280 cooperating in a manner hereinafter explained. The shaft 275 carries near the bottom thereof a stop pin 285 extending transversely of the shaft 275, the pin 285 serving to position the cylindrical member 280 in a predetermined vertical relationship with the housing 240, thereby to move the valve 265 into or out of the operative position, all as hereinafter explained.

With reference now to the cylinder 230, there is shown therein a piston 300, the piston 300 carries in a circular groove therearound an O-ring for sealing hydraulic fluid within the cylinder 230 thereby to cause movement of the fluid in response to movement of the piston 300. Connected to the piston 300 is a vertically disposed cylindrical shaft 302 extending vertically upward from the piston 300. Connected to top of the cylinder 230 and the housing 240. Fixedly and securely attached to the shaft 302 is a piston cable 305 by means of a connector 303, the cable 305 extending upwardly parallel to the upright 110 and passing over the small pulley 125 and downwardly therefrom to a winch 310. The cable 305 is maintained in position on the pulley 125 by the cover 128.

The winch 310 provided part of the motor mechanism for raising and lowering the carriage 150 as hereinafter explained and includes, as seen in FIGS. 1 and 4, a housing 312 connected to the upright 110 by a tongue 311, the housing 312 is further provided with a U-shaped handle or bar 313 for aiding in moving the device 100 from place to place, the U-shaped handle 313 being suitably connected to the housing 312 by bolts. Inside the housing 312 there is provided a takeup drum 314 rotatably mounted on an axle 315 suitably journaled in the housing 312; the winch 310 is further provided with arms 316 fixedly connected to the axle 315 for rotation therewith, the arms 316 fixedly connected to the axle 315 for rotation therewith, the arms 316 each carry on their outer ends respectively knobs 317 for conveniently gripping the arms 316. A brake 318 is positioned on the left-hand side of winch 310, as seen in FIG. 3, for preventing rotation of the drum 314 when the carriage 150 has been vertically positioned at a desired point, the brake 318 operating in the usual manner. As best seen in FIGS. 1 and 3, the housing 312 of the winch 310 rests on an arcuate bottom plate 321 from which depends a vertical tongue 322, the vertical tongue 322 being positioned between two diagonally extending brace members 323. The brace members 323 provide support for the winch 310 and may be tubular inform, each having a vertical attachment flange 324 at the top thereof connected to the tongue 322 by a bolt 325. The brace members 323 each carry at the bottom end thereof a lower vertical attachment flange 326 having an aperture therein, each attachment flange 326 having an aperture therein, a bolt 328 and a pedal lock pin 329 to a respective upstanding anchor or flange 327 on the base 102, the pedal 329 extending inwardly toward the center of the base and fixed by the bolt 328 against vertical movement with respect to the base 102, for a purpose hereinafter explained. As may be seen therefore, activation of the winch 310 to raise the carriage 150 also raises the piston 300 by means of the cable 305 and the shaft 302.

As hereinbefore stated, certain parts of the device 100 are adapted to rotate in a circular path and as shown before, the ball bearings 219 provide for the rotation of the pulley 185 with respect to the upright 110 and the carriage 150. Certain portions of the hydraulic system 225 rotate with the pulley 185 and to that end, as seen in FIG. 8, a block 335 having therein a central aperture 336 is positioned around and rotatable with respect thereto, the distal end of the housing 240, the housing 240 being provided with grooves and O-rings 337 to prevent the escape of hydraulic fluid. The block 335 is prevented from movement away from the housing 240 by means of a fastener 338 while the nut 247 on the threaded portion 246 of the housing 240 and the washer 248 prevent forward movement of the block 335 toward the annular plate 210. The block 335 further has therein a transverse aperture 339 extending from the central aperture 336 outwardly through the block 335, the aperture 339 being in registry with the circular groove 243A in the housing 240, thereby to provide a passageway between the cylinder 230 and the transverse aperture 339 of the block 335 for hydraulic fluid when

the valve 265 is in its operative position. Connected to the block 335 and in registry with the aperture 339 is a fitting 340 having at one end thereof a flexible hose 341 leading to a second fitting 342, the fittings 340 and 342 with the hose 342 providing communication between the block 335 and hence the housing 240 with a cylinder 345.

The cylinder 345 includes a rear circular end plate 346 having in the upper end thereof, as seen in FIG. 8, a groove 347 which cooperates with a pin 348 and groove 347 cooperating to provide flexible alignment of the cylinder 345 with the block 335 as the block 335 and the cylinder 345 rotate with the pulley 185. The rear end plate 346 carries on the center of the inner surface thereof a stop plate 339 in the form of a disc extending inwardly of the end plate 346, the stop plate 349 being for a purpose hereinafter to be explained. The cylinder 345 further includes a tubular body 350 sealably connected to offset portion of the end plate 346 and a front end plate 351 also sealably secured to the tubular body 350, thereby to provide a closed cylinder 345. Within the cylinder 345 and slidable therewith is a piston 355 carrying therearound an O-ring 356 to provide for sealing of the hydraulic fluid in the chamber defined between the end plate 346 and the piston 355.

There is further provided in the piston 355 a central aperture 357 having an offset portion which carries therein a tubular piston shaft 358, the tubular piston shaft 358 having externally thereabout a threaded portion 359, the threaded portion 359 being longitudinally spaced from the piston 355, and at the distal end of the tubular piston shaft 358 there is provided a second piston 360 fixedly connected to the shaft 358, the piston 360 carrying O-ring 361 thereabout. The second piston 360 at the end of the tubular piston shaft 358 opposite the piston 355 is carried in a second cylinder 365, the second cylinder 365 is provided with suitable flanges 366 to position the shaft 358 centrally within the cylinder 365 and an adjustment nut 367 is positioned about the threaded portion 359 of the tubular shaft 358, the adjustment nut 367 to limit axial movement of the shaft 358 within the cylinder 365.

Disposed within the tubular piston shaft 358 is a rod 370, the rod 370 carrying on its respective ends valve heads 371 and 373, on the left-hand end of the shaft 358, as seen in FIG. 8, there is provided a coil spring 372 positioned between the valve head 371 and the adjacent end of the tubular piston shaft 358, the spring 372 serving to bias the valve head 371 in an open position spaced from the valve seat formed in the piston 355, the spring 372 serving to bias the valve head 373 in a closed position seated on the valve seat formed in the piston 360. Additionally, a spring 375 is positioned about the tubular piston shaft 358 between the piston 355 and the front end plate 351 of the cylinder 345, the spring 375 serving to bias the piston 355 toward the rear end plate 346 of the cylinder 345 and the stop plate 349 or disc carried thereby.

With reference to FIGS. 6 to 8, the device 100 is provided with a movable arm 380, the movable arm 380 being positioned between the plates 191 of the support frame 190 and including a channel-shaped member having two spaced-apart parallel legs 381 interconnected by a web 382 and at the forward end of the arm 380, as seen in FIG. 4, there is provided an outwardly extending stop flange 383. The movable arm 380 is further provided with a rear hinge 385 sealably connected to the second cylinder 365, the hinge 385 including a shaft 386 extending therethrough, thereby to provide pivotal movement between the arm 380 and the cylinder 365. Attached to the crosspiece 194 of the support frame 190 are two outwardly extending ears 388, each of the ears 388 having therein an aperture, the aperture being aligned for receiving a shaft 389 extending transversely of the ears 388. Interconnecting the shaft 389 between the ears 388 and the shaft 386 of the rear hinge 385 are two coil springs 390, the coil springs 390 serving to bias the movable arm 380 into a drum-receiving position.

About the middle of the movable arm 380 are two transversely disposed tubular spacers 393, the spacers 393 serving to maintain the movable arm 380 in position on a shaft 395, the shaft 395 being rotatably journaled in the apertures 193 in the outwardly extending arms 192 of the support frame 190, thereby to pivotally mount the movable arm 380 in the support frame 190 at the outer ends of the arms 192. At the outermost end of the movable arm 380 away from the frame 190 there are provided aligned apertures 397, one aperture 397 being in each of the parallel legs 381 for receiving a shaft 398, the shaft 398 suitably secured in the aperture 397 thereby to provide for pivotal movement with respect to the arm 380 of a movable jaw 400 carried by the shaft 398.

The movable jaw 400 is pivotable between a drum-receiving position as seen in FIG. 4, and a drum-gripping position as seen in FIG. 5, the jaw 400 including two parallel spaced-apart boomerang-shaped flanges 410 interconnected by a bight 402, the bight 402 being arcuate to form an abutment surface 403. As may be seen therefore, the jaw 400 is pivotable with respect to the movable arm 380 and the movable arm 380 is pivotable with respect to the support 190.

There is also provided at the other side of the support 190 a stationary arm 410, the stationary arm 410 being positioned between the plates 191 and including a channel-shaped member having two parallel spaced-apart legs 411 interconnected by a web 412, and at the forward end of the stationary arm 410, as seen in FIG. 1, there is provided an outwardly extending stop flange 413. The stationary arm 410 is further provided with a rear hinge 415 having a shaft 416 extending therethrough. Attached to the crosspiece 194 of the support frame 190 are two outwardly extending spaced-apart ears 418, each of the ears 418 having therein an aperture, the apertures being aligned for receiving a shaft 419 extending transversely of the ears 418. Connected to the bottom of the shaft 419 is a coil spring 420, the coil spring 420 interconnecting the shaft 416 of the rear hinge 415 with the crosspiece 194 of the support frame 190, the spring 420 serving to maintain the arm 410 stationary. The shaft 419 extends through an attachment end of a rod 425 being positioned transversely of the shaft 419 and extending outwardly from the crosspiece 194, the rod 245 having a threaded portion and being slidably positioned within a cylinder 426. An adjustment nut 427 for adjusting the outward extent of the rod 245 and the cylinder 426 is connected to the cylinder 426 and is in threaded connection with the rod 245, the cylinder 426 being suitably sealed to the hinge 415 of the stationary arm 410. The cooperation of the spring 420, the rod 425, the cylinder 426 and nut 427 serving to maintain stationary the arm 410.

About the middle of the stationary arm 410 there are provided two transversely disposed tubular spacers 433 and a shaft 435 extending therethrough, the shaft 435 serving to mount the stationary arm 410 between the arms 192 of the support frame 190. At the outermost end of the stationary arm 410 away from the frame 190, there are provided aligned apertures in the legs 411, one aperture being in each leg 411 for receiving a shaft 438 therethrough for mounting thereon a jaw 440, the jaw 440 being pivotable with respect to the stationary arm 410. The jaw 440 is channel-shaped in cross section and has two spaced-apart parallel boomerang-shaped flanges 441 interconnected by a bight 442, the bight 442 being arcuate to form an abutment surface 443. There is further provided a torsion spring 444 positioned about the shaft 438, the spring 444 serving to bias the pivotable jaw 440 into a drum-receiving position, as shown in FIG. 4.

As seen in FIGS. 2, 3 and 10, tipping or tilting of the pulley 185 and therefore the arms 380 and 410 is provided in one direction by a pulley cable 450, the cable 450 being fixedly connected to the cable grip 117 on the left boomerang-shaped arm 116, as viewed in FIG. 2, the cable 450 being looped once around the pulley 185 between the flange 187 and the side wall 186, the cable 450 being connected at its other end by a bolt 451 to a longitudinally extending shaft 452, the shaft 452 being pivoted for up-and-down movement with respect to the base 102 at 453 and being pivoted for lateral movement with respect to the base 102 at 454. At the other end of the shaft 452 from the pivot 453 there is provided a foot pedal 455, the

foot pedal 455 carried by an inwardly extending member 456 from the shaft 452. There is likewise provided a second pulley cable 460 similar in construction and attachment to the pulley cable 450, the cable 460 being fixedly connected to the cable grip 117 on the right boomerang-shaped arm 116, as viewed in FIG. 2, the cable 460 being looped once around the pulley 185 and residing in the other groove defined by the flange 187 and the other sidewall 186, the cable 460 at its other end being suitably connected by a bolt 461 to a longitudinally extending shaft 462 for vertical or up-and-down movement with respect to the base 102 at 463 and being pivoted for lateral movement with respect to the base 102 at 463 and being pivoted for lateral movement with respect to the base 102 at 464. At the other end of the shaft 462 is a foot pedal 465 carried by an inwardly extending member 466 of the shaft 463.

The pulley cables 450 and 460 in combination with the winch 310 provide for rotational movement of the pulley 185 thereby to provide the tipping or tilting of a drum 475 held by the arms 380 and 410 and the respective jaws 400 and 440 carried thereby.

In operation, the jaws 400 and 440 carried by the arms 380 and 410 are normally biased into a drum-receiving position due to the action of the coil springs 390 and 420 and the action of the torsion springs 444 as best seen in FIG. 4 of the drawings, further outward movement of the jaws 400 and 440 being prevented by stops 383 and 413 on the arms 380 and 410, respectively. An operator pushes the device 100 forward until the jaws 400 and 440 contact the drum 475 and pivot with respect thereto until the drum 475 rests against the drum rest 290 and the arms 400 and 440 substantially encircle the drum 475. At this point, the valve 265 is in the open position due to the positioning of the stop plate 140 on the upright 110 to contact the shaft 275 when the carriage 150 is in its lowest position; thereafter the drum 475 is in position to be gripped by the jaws 400 and 440 by activation of the hydraulic system 225 as hereinafter explained.

The hydraulic system is primed to introduce hydraulic fluid thereto through the oil feed 225, the oil feed 255 providing by means of the vertical pipe 256 communication to the housing 240 and the cylinder 230. When a predetermined amount of hydraulic fluid has been admitted to the cylinder 230, the hydraulic system 225 is primed and ready for operation, thereafter the cap 261 is fixed in place. Upon activation of the motor mechanism or winch 310, either by manually turning the arms 315 or by using a motor (not shown), the cable 305 connected to the drum 314 is wound thereof and thereby raises the piston shaft 302 and the piston 300 connected thereto. Raising the piston 300 in the cylinder 230 forces the hydraulic fluid out of the cylinder 230 through aperture 244 therein and through aperture 241 in the housing 240 and into the cylinder 345 via the block 335, the fittings 340 and 342 and the flexible hose 341, provided that the safety valve 265 is in the operative position to allow hydraulic fluid to flow therethrough.

Because of the spring 372, the valve head 371 is biased into an open position away from the associated valve seat and the hydraulic fluid flowing into the cylinder 345 flows through the aperture 357 in the piston 355 and through the hollow piston shaft 358 to contact the valve head 373 at the other end of the shaft 358. When the hydraulic pressure is sufficient, the valve head 373 is moved into an open position away from the corresponding valve seat in piston 360 to allow the hydraulic fluid to flow into the portion of the cylinder 365 between the piston 360 and the hinge 385. Movement of the piston 355 due to the hydraulic fluid in the cylinder 345 at this point is prevented by the coil spring 375 positioned between the piston 355 and the front end wall 351 of the cylinder 345, the coil spring 375 serving to bias the piston 355 against forward movement thereof. As the hydraulic fluid flows into the cylinder 365 between the piston 360 and the hinge 385, the cylinder 365 is moved away from adjustment nut 367 thereby to move the rear end of the movable arm 380 outwardly away from the cylinder 345 and to pivot the movable arm 380 about the shaft 395 to move the forward end of the movable arm 380 carrying thereon the jaw 400 into contact with the drum 475, the action of the hydraulic fluid in the cylinder 365 providing a coarse adjustment of the jaw 400 against the drum 475, this being necessary due to the irregularities in the circumferences of the various drums 475. After the cylinder 365 is filled with the hydraulic fluid, the valve head 373 is forced into a seated position and no further hydraulic fluid is admitted through the tube 358 whereupon further admission of the hydraulic fluid into the cylinder 345 results in movement of the piston 355 along the cylinder 345, thereby to compress the spring 375 and further move the movable arm 380 about the pivot shaft 395 into the drum-gripping position, whereby the drum 475 is securely gripped between the movable arm 380 and the stationary arm 410.

The stationary arm 410 is not hydraulically adjustable; however, the arm 410 is provided with a coarse adjustment by means of the adjustment nut 427. The shaft 425, the adjustment nut 427 and the cylinder 426 operatively connected to the rear hinge 415 of the arm 410 and cooperating to prevent outward movement of the arm 410, the spring 420 serving to prevent inward movement of the arm 410.

After a portion of the hydraulic fluid is forced out of the cylinder 230 and into the cylinders 345 and 365, thereby to move the arms 380 and 410 into the drum gripping position, further movement of the winch 310 will cause an upward vertical movement of the carriage 150 on the upright 110 due to the fact that the hydraulic fluid is incompressible. Upward sliding movement of the carriage 150 is facilitated by the rollers 162, 167, 172 and 235 as hereinbefore explained. As the carriage 150 and the hydraulic system 225 is pulled upward by the winch 310, rotation of the pull cord 376 as shown particularly in FIG. 11, will cause the stop pin 285 to disengage from the upturned flange 156 and because the gear segment 271 is weighted, the gear segment 271 will rotate in a downward direction, thereby to cause rod 266 to rotate to move the aperture 268 out of registry with the aperture 241 closing the valve 265 to close. When the valve 265 is closed, the hydraulic fluid in the cylinder 345 and the cylinder 365 is prevented from flowing out of the cylinders and into the cylinder 230 thereby to prevent premature release of the drum 475 by the arms 380 and 410 and the jaws 400 and 440 respectively carried thereby. As may be seen from FIG. 10, and as hereinbefore explained, the valve 165 has an open position only when the apertures 268 and 241 are in registry and after the aperture 268 is moved out of registry with the aperture 241, the valve 265 is closed to prevent passage of the hydraulic fluid therethrough. The stop pin 285 generally rests on the upstanding flange 156 of the carriage 150 when the valve 265 is in the open position; however, it may manually be moved off of the flange 156 by means of the pull cord 276, it is herein noted that rotation of the pull cord 276, as shown by the arrow in FIG. 11, will not in and of itself cause the valve 265 to move to a closed position due to the fact that the circular flanges 281 on the cylindrical member 280 do not form a worm gear thereby resulting in movement of the gear section 271 upon rotation of the cylindrical member 280. Rotation of the cord 276 serves to move the stop pin 285 off of the flange 156 thereby to permit downward movement of the cylindrical member 280 which does result in the closing of the valve 265. Once the valve 265 is closed, further movement of the arms 380 and 410 and thereby the jaws 400 and 440 carried thereby is prevented. When the carriage 150 and thereby the housing 240, the pulley 185 and the arms 380 and 410 are in the desired position spaced from the ground, rotation of the pulley 185 thereby to tilt or tip the drum 475 for the emptying thereof is provided by means of the pulley cables 450 and 460.

To rotate the drum 475 to the left as shown in FIG. 3, the left-hand foot pedal 465 carried by the shaft 462 is moved inwardly by means of the pivot at 464 and depressed underneath the pedal lock pin 329 by means of the pivot at 463, thereby to tighten the cable 460 around the pulley 185. After the cable 460 is tightened around the pulley 485, further upward move-

ment of the carriage 150 along the upright 110 by activation of the winch 310, will cause the pulley 185 to rotate to the left as shown in FIG. 3, thereby to tip or tilt the drum 475. Lowering of the carriage 150 will then rotate the drum to the right and back to its normal vertical position, the stop member 189 extending transversely of the pulley 185 and the stop plate 177 cooperating to prevent he pulley 185 from rotating beyond the normal vertical position. However, if it is desired to rotate the pulley 185 to the right, then the stop plate 177 is pivoted out of operative position, thereby to allow rotation of the pulley 185 to the right by activation of the right-hand cable 450 and foot pedal 455, all as hereinbefore explained with reference to cable 460. It is seen therefore, that tipping or tilting of the drum 475 is provided by tightening one of the cables 450 or 460 around the pulley 185 by activating the associated foot pedal 455 or 465 coupled with a movement of the carriage 150 along the upright 110 by activation of the motor means or winch 310. The drum 475 may be fixed against further vertical movement along the upright 110 at any point by either activating the brake 318 or tightening both cables 450 and 460 around the pulley 185, activation of the brake 318 being the preferred method.

Once the contents of the drum 475 have been emptied by the aforementioned tilting or tipping thereof, it may be desired to rest the drum at an elevated position, such as on a ledge, a shelf or some other support. If the shelf is at an elevated position with respect to the drum 475, then the brake 318 on the winch 310 may be released and the winch 310 operated to further elevate the drum 475, as hereinbefore explained, to the desired height, conversely, if the shelf is at a lower position than the drum 475, the winch 310 may be operated in a reverse direction to lower the drum 475 to the desired height. Clearly, the entire device 100 may be wheeled by means of the caster assemblies 105 and wheels 106 to the desired position relative to the shelf before the drum 475 is positioned thereon; once the device 100 is in the proper position, activation of the wheel locks 109 will prevent further unwanted movement of the device 100. After the drum 475 is positioned on the shelf, the jaws 400 and 440 will remain along with the arms 380 and !10 in the drum-gripping position due to the position of the valve 265. To release the drum 475, the valve 265 is manually operated by means of the pull cord 276, the cylindrical member 280 and gear segment 271 to the open position in which the aperture 268 in the valve 265 is in registry with the registry with the aperture 241 in the housing 240, or The valve-release bracket 134 is set at a predetermined height in relation to the shelf to contact the valve shaft 275 and move to the open position thereby to allow movement of the hydraulic fluid from the cylinders 365 and 345 into the cylinder 230.

When the valve 265 is in the open position, further reverse movement of the winch 310 results in movement of the piston 300 in the cylinder 230 downwardly, thereby to provide a space for the hydraulic fluid in the cylinder 230. Since the movable arm 380 is normally biased to the drum-receiving position by the coil springs 390 associated with the hinge 385, there is force tending to move the cylinder 365 toward the adjustment nut 367 and coupled with this force is the action of the spring 375 tending to move the piston 355 toward the rear wall 346 of the cylinder 345. Upon release of the hydraulic fluid by the cooperation of the downward movement of the piston 300 in the cylinder 230 and the opening of the valve 265, hydraulic fluid flows out of the cylinder 345 through the fitting 342 and hose 341 into the block 335 and therethrough the housing 240 into the cylinder 230. The action of the spring 375 serves to move the piston 355 to the left, as viewed in FIG. 8, thereby to cause the valve head 371 to contact the stop disc or plate 349 positioned on the rear wall 346 of the cylinder 345. Contact of the valve head 371 on the stop disc or plate 349 serves to move the valve head 373 on the opposite end of the rod 370 off of the associated valve seat in the piston 360, thereby to allow the hydraulic fluid in the cylinder 365 between the piston 360 and the hinge 385 to flow therefrom through the tubular shaft 385 into the chamber formed between the piston 355 and the rear wall 346 of the cylinder 345 and hence thereout through the aforementioned channel to the cylinder 230. It may be seen therefore, that it is the cooperation of the springs 390, the springs 375 and 357, the valve 265 and the piston 300 which serves automatically to move the arm 380 into the drum-receiving position upon the release of the piston 300 by the winch 310, thereby to provide a space for the hydraulic fluid in the cylinder 230. The adjustment nut 367 limits the outward movement of the arm 380 thereby to define the drum-receiving position thereof, it being understood that the arms 380 and 410 rest on the shelf supporting the drum 475 due to the release of the winch 310.

Simultaneously with the release of the hydraulic fluid from the cylinders 365 and 345, the torsion spring (not shown) associated with the arm 380 and the torsion spring 444 associated with the arm 410 serve to bias the jaws 400 and 440 respectively into the drum-receiving position, as shown in FIG. 4, whereby the device 100 may be wheeled away from the drum 475 leaving it in its elevated position, the valve 265 having been manually closed so as to prevent the hydraulic fluid from flowing out of the cylinder 230 and to cause the arm 380 to assume the drum-gripping position upon further movement along the upright 110, thereby to allow the winch 310 to be activated to raise or lower the carriage 150 without corresponding movement of the arm 380 to the drum-gripping position so that the jaws and arms will remain in the drum-receiving position to close around another drum at the same or at a different elevated position as the drum just released. It may be seen therefore, that by manual operation of the valve 265 it is possible to maintain the arms and jaws in either the drum-gripping position or the drum-receiving position irrespective of whether the carriage 150 is slidably moved up and down along the upright 110.

As hereinbefore stated, the tipping or tilting of the drum 475 is provided by rotation of the pulley 185, the pulley 185 being rotatable with respect to the upright 110 by means of the ball bearings 219 positioned between the ball races 197 and 204 and the ball races 198 and 214 thereby to permit rotation of the pulley 185, the movable arm 380 and stationary arm 410 connected thereto. Rotation of certain portions of the hydraulic system 225 with the pulley 185 is provided by means of the block 335 which is rotatable around the circular portion of the housing 240 thereby to permit rotation of the block 335, the fittings 340 and 342, the flexible hose 341, the cylinders 345 and 365 with the pulley 185. Movement of the cylinder 345 in response to movement of the movable arm 380 from the drum-receiving position to the drum-gripping position is provided for by the groove 347 in the rear plate 346 of the cylinder 345 and the corresponding pin 348 in the block 335, thereby to provide for some lateral movement of the cylinder 345 with respect to the block 335.

As may be seen therefore, there has been provided a device 100 for lifting and tipping or tilting articles or drums 475, the device 100 comprising a base 101, an upright 110 supported on the base 101, a carriage member 150 slidable on the upright 110 for up and down sliding movement therealong, a first jaw 400 mounted on a movable arm 380 connected to the carriage 150, the first jaw 400 being pivotable between a drum-receiving position and a drum-gripping position, hydraulic motor means including the cylinder 230 and piston 300 for moving the movable arm 380 and thereby the first jaw 400 moving the movable arm 380 and thereby the first jaw 400 mounted thereon into the drum-gripping position, the hydraulic motor means further including a cylinder 345 having therein a piston 355 for sliding movement therewithin, a cylinder 365 having therein a piston 360 for sliding movement therewithin, the cylinder 365 being operatively connected to the movable arm 380, the hollow stem 358 interconnecting the cylinder 345 with the cylinder 365 and the piston 355 with the piston 360, and a valve including the rod 370 and valve heads 371 and 373 disposed in the hollow stem 358 for controlling the flow of hydraulic fluid between the cylinder 345 and the cylinder 365, whereby fluid entering the cylinder 345

when the valve is open flows through the stem **358** into the cylinder **365** to move the movable arm **380** into contact with the drum **475** and to fill the cylinder **365** with fluid whereby the valve closes and the fluid entering the first cylinder **345** moves the piston **355** therewithin and thereby the cylinder **365** to move the movable arm **380** and the jaw **400** carried thereby into the drum-gripping position, a jaw **440** mounted on a fixed arm **410** connected to the carriage **150**, the jaw **440** being pivotable between a drum-receiving position and a drum-gripping position, the jaw **400** and the jaw **440** in the drum-gripping position securely gripping and substantially encircling the drum **475**, motor mechanism including the winch **310** connected to the carriage **150** for raising and lowering the carriage **150** and the jaws **400** and **440** connected thereto along the upright **110** and means including the pulley **185** for tilting or tipping the jaws **400** and **440** and the drum **475** gripped thereby.

What is claimed is:

1. A device for lifting and tipping or tilting articles, said device comprising a base, an upright supported on said base, a carriage member slidable on said upright for up-and-down sliding movement therealong, an article-gripping member connected to said carriage and movable between an article-receiving position wherein said article-gripping member is in position to receive an article and an article-gripping position wherein said article-gripping member is in position securely to grip the article, hydraulic means for activating said article-gripping member from said article-receiving position thereof to said article-gripping position thereof, motor mechanism including a winch and a cable connected to said carriage for raising and lowering said carriage and said article-gripping member, activation of said winch to raise said article-gripping member causing activation of said hydraulic mechanism to move said article-gripping member from said article-receiving position thereof to said article-gripping position thereof, means for tilting or tipping said article-gripping member and the article gripped thereby responsive to activation of said winch, and means for selectively operating said tilting or tipping means, whereby activation of said winch and hence said hydraulic means results in lifting of the article gripped by said article-gripping member and activation of said winch and hence said hydraulic means in combination with selective activation of said tilting or tipping means results in simultaneous lifting of the article and tipping or tilting the same.

2. The device set forth in claim **1**, wherein said upright comprises a plurality of telescoping sections adapted to be fixedly secured in an end-to-end relationship.

3. The device set forth in claim **1**, wherein said carriage includes rollers engaging said upright for facilitating sliding movement of said carriage up and down said upright.

4. The device set forth in claim **1**, wherein said means for tilting, tipping or rotating the article-supporting member include a pulley rotatably secured to said carriage for rotation with respect thereto, said pulley being slidable with said carriage for sliding up-and-down movement along said upright, and a cable operatively connected to said pulley and said base, said cable adapted to be tightened about said pulley, thereby to rotate said pulley for tilting said article-supporting member in response to subsequent movement of said carriage along said upright.

5. A device for lifting and tipping or tilting drums, said device comprising a base, an upright supported on said base, a carriage member slidable on said upright for up-and-down sliding movement therealong, two jaws connected to said carriage, said jaws being pivotable between a drum-receiving position and a drum-gripping position, hydraulic motor means for moving at least one of said jaws into said drum-gripping position, said jaws in said drum-gripping position securely gripping and substantially encircling the drum, motor mechanism including a hand-operated winch connected to said carriage for raising and lowering said carriage and said jaws, said hydraulic motor means being operated upon activation of said motor mechanism to raise said carriage along said upright, and means for tilting or tipping said jaws and the drum gripped thereby, said tilting or tipping means being selectively operable so as to permit said carriage to be raised without tilting or tipping said jaws and to permit said carriage to be raised along said upright while simultaneously tilting or tipping said jaws.

6. The device as wet forth in claim **5**, wherein said jaws each include an arcuate inner surface, said surfaces substantially conforming to the outer surface of the drum gripped thereby.

7. The device set forth in claim **5** and further including spring mechanism for biasing said jaws into said drum-receiving position.

8. The device set forth in claim **5**, wherein said hydraulic motor means are carried by said carriage member and are slidable therewith for up-and-down movement along said upright.

9. The device as set forth in claim **5** wherein a certain portion of said hydraulic motor means is carried by said carriage member and is slidable therewith for up-and-down sliding movement along said upright, and a certain portion of said

10. A device for lifting and tipping or tilting drums or other articles, said device comprising a base, an upright supported on said base, a carriage member slidable on said upright for up-and-down movement therealong, two jaws connected to said carriage, said jaws being pivotable between a drum-receiving position and a drum-gripping position, hydraulic motor means for moving at least one of said jaws into said drum-gripping position, said jaws in said drum-gripping position securely gripping and substantially encircling the drum, motor mechanism connected to said carriage for raising and and lowering said carriage and said jaws, a safety valve associated with said hydraulic motor means for preventing premature release of said jaws from said drum-gripping position, thereby to prevent unintentional release of the drum, and means for tilting and tipping said jaws and the drum gripped thereby, said tilting and tipping means including at least one foot pedal selectively connectable to said motor mechanism to permit selective operation of said foot pedal and thereby said tilting and tipping means during operation of said motor mechanism resulting in simultaneous movement of said carriage along said upright and rotation of said carriage so as to tip or tilt said jaws and the drum gripped thereby.

11. The device as set forth in claim **10**, wherein said safety valve is automatically activated upon the raising of the drum by operation of said motor mechanism.

12. The device as set forth in claim **10**, wherein said safety valve is automatically activated upon the raising of the drum by operation of said motor mechanism, and further comprising means for operating said safety valve when the drum is raised off the ground to permit movement of said jaws from said drum-gripping position to said drum-receiving position.

13. The device set forth in claim **10**, wherein said safety valve is adapted automatically to release when said carriage is at the lowest point of travel along said upright.

14. A device for lifting and tipping or tilting drums, said device comprising a base, an upright supported on said base, a carriage member slidable on said upright for up-and-down sliding movement therealong, a first jaw mounted on a movable arm connected to said carriage, said first jaw being pivotable between a drum-receiving position and a drum-gripping position, hydraulic motor means for moving said movable arm and thereby said first jaw mounted thereon into said drum-gripping position, a first cylinder and piston, said first piston being adapted for sliding movement within said first cylinder, said first cylinder being fixedly connected to said carriage for up-and-down sliding movement therewith along said upright, said first piston being operatively connected to said motor mechanism, a second cylinder and piston operatively connected to said first cylinder, said second piston being operatively connected to said movable arm and being adapted for sliding movement within said second cylinder, a second jaw mounted on a fixed arm connected to said carriage, said second jaw being pivotable between a drum-receiving position

and a drum-gripping position securely gripping and substantially encircling the drum, motor mechanism connected to said carriage for raising and lowering said carriage and said jaws connected thereto, and means for tilting or tipping said jaws and the drum gripped thereby, said second cylinder being connected to said means for tilting said jaws for tilting movement therewith, activation of said motor mechanism to move said carriage upward along said upright moving said first piston upwards in said cylinder thereby to force hydraulic fluid therein into said second cylinder to move said second piston and thereby said movable arm and said jaw mounted thereon into said drum-gripping position.

15. The device as set forth in claim 14 and further comprising spring means associated with said movable arm to bias said movable arm away from said drum-gripping position.

16. The device set forth in claim 14, and further comprising spring means associated with said jaws to bias said jaws into said drum-receiving position.

17. The device as set forth in claim 14, and further comprising means for hydraulically adjusting said movable arm to move said jaw mounted thereon into abutting relationship with the drum prior to moving said movable arm and said jaw mounted thereon into said drum-gripping position.

18. A device for lifting and tipping or tilting drums, said device comprising a base, an upright supported on said base, a carriage member slidable on said upright for up-and-down-sliding movement therealong, a first jaw mounted on a movable arm connected to said carriage, said first jaw being pivotable between a drum-receiving position and a drum-gripping position, hydraulic motor means for moving said movable arm and thereby said first jaw mounted thereon into said drum-gripping position, said hydraulic motor means including a first cylinder having therein a first piston for sliding movement therewithin, a second cylinder having therein a second piston for sliding movement therewithin, said second cylinder being operatively connected to said movable arm, a hollow stem interconnecting said first and second cylinders and said first and second pistons, and a valve disposed in said hollow stem for controlling the flow of hydraulic fluid between said first and second cylinders, whereby fluid entering said first cylinder when said valve is open flows through said stem into said second cylinder to move said movable arm into contact with the drum and to fill said second cylinder with fluid whereby said valve closes and fluid entering said first cylinder moves said first piston therewithin and thereby said second cylinder to move said movable arm and said jaw carried thereby into said drum-gripping position, a second jaw mounted on a fixed arm connected to said carriage, said second jaw being pivotable between a drum-receiving position and a drum-gripping position, said first jaw and said second jaw in aid drum-gripping position securely gripping and substantially encircling the drum, motor mechanism connected to said carriage for raising and lowering said carriage and said jaws connected thereto, and means for tilting or tipping said jaws and the drum gripped thereby.

19. A device for lifting and tipping or tilting articles, said device comprising a base, an upright supported on said base, a carriage member slidable on said upright for up-and-down sliding movement therealong, an article-gripping member connected to said carriage, said gripping member being hydraulically adjustable securely to grip the article, mechanism connected to said carriage for raising and lowering said carriage and said article-gripping member, and means for tilting or tipping said article member and the article gripped thereby, said means, including a pulley rotatably secured to said carriage for rotation with respect thereto, said pulley being slidable with said carriage along said upright, two foot pedals supported on said base, two cables disposed about said pulley, each of said cable being fixedly connected to one of said foot pedals and to said upright, said foot pedals being movable to tighten the associated one of said cables around said pulley, whereby rotation of said pulley in response to the tightening of one of said cables about said pulley and subsequent movement of said carriage along said upright tilts the article gripped in said hydraulically adjustable article-gripping member.

20. A device for lifting and tipping or tilting drums or other articles, said device comprising a base, an upright supported on said base, a carriage member slidable on said upright for up-and-down sliding movement therealong, two jaws connected to said carriage, said jaws being pivotable between a drum-receiving position and a drum-gripping position, hydraulic motor means for moving at least one of said jaws into said drum-gripping position, said jaws in said drum-gripping position securely gripping and substantially encircling the drum, motor mechanism connected to said carriage for raising and lowering said carriage and said jaws, a safety valve associated with said hydraulic motor means for preventing premature release of said jaws from said drum-gripping position and including a gear segment associated with a cylindrical member having thereon circular spaced-apart flanges for cooperation with said gear segment whereby up-and-down movement of said cylindrical member moves the gear segment in an arc, thereby to operate said safety valve.

* * * * *