Aug. 2, 1932. H. W. PROTZELLER 1,869,774

RAILROAD SPREADER

Filed Feb. 23, 1929 3 Sheets-Sheet 1

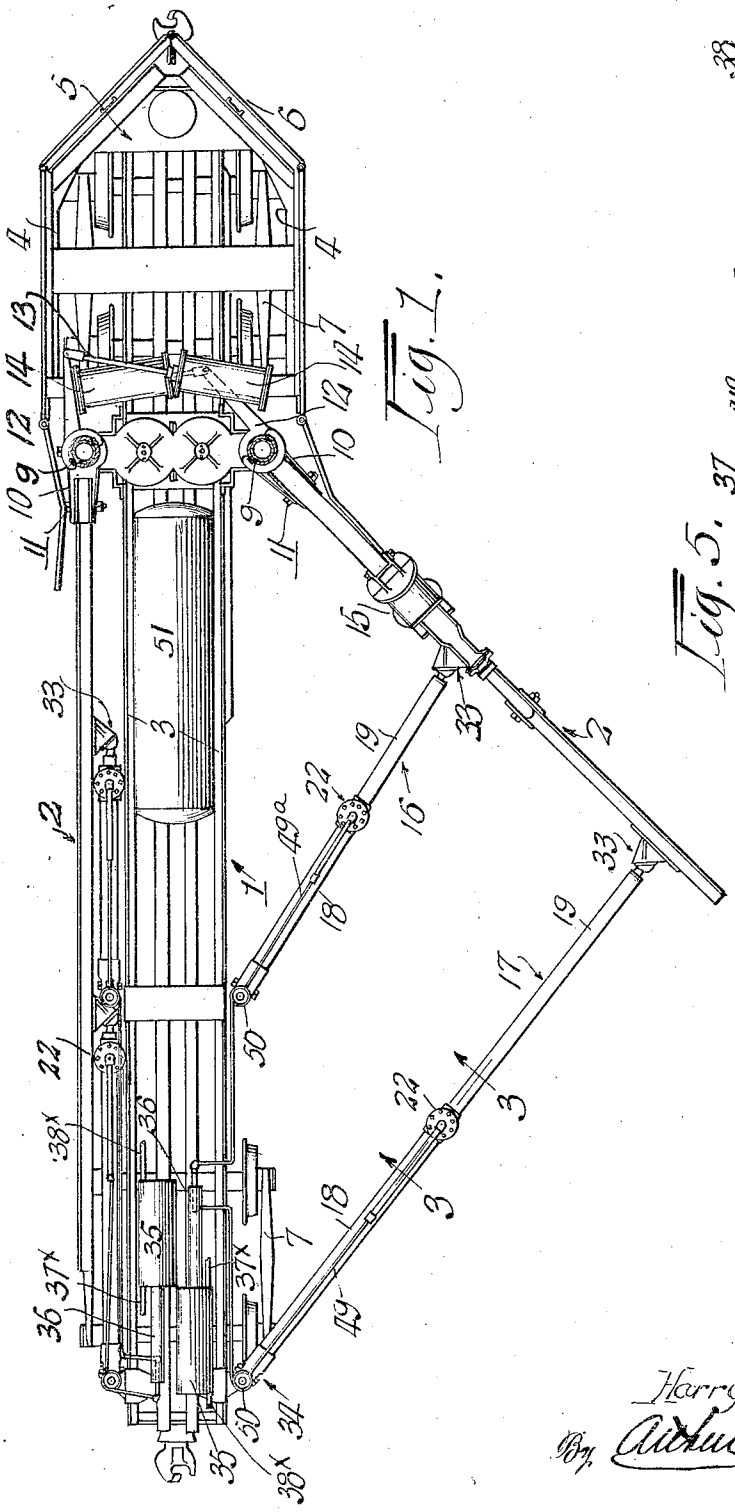


Fig. 1.

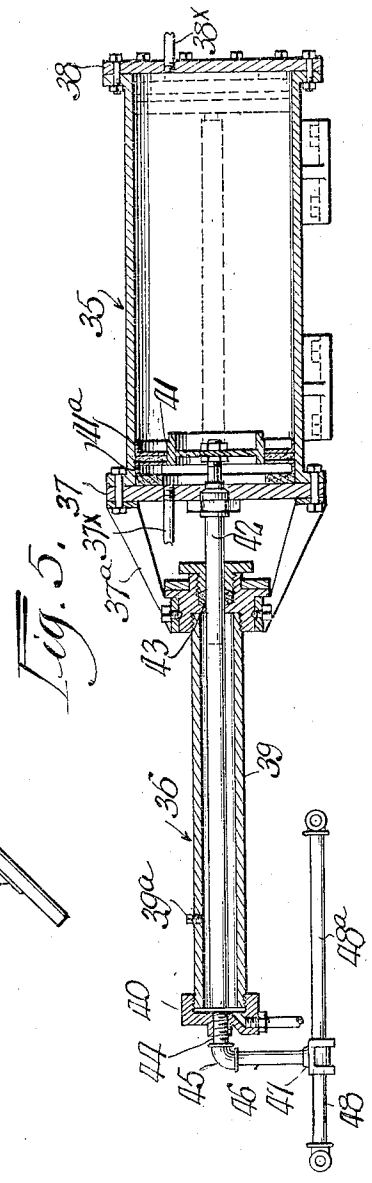


Fig. 5.

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RAILROAD SPREADER

Filed Feb. 23, 1929 3 Sheets-Sheet 2

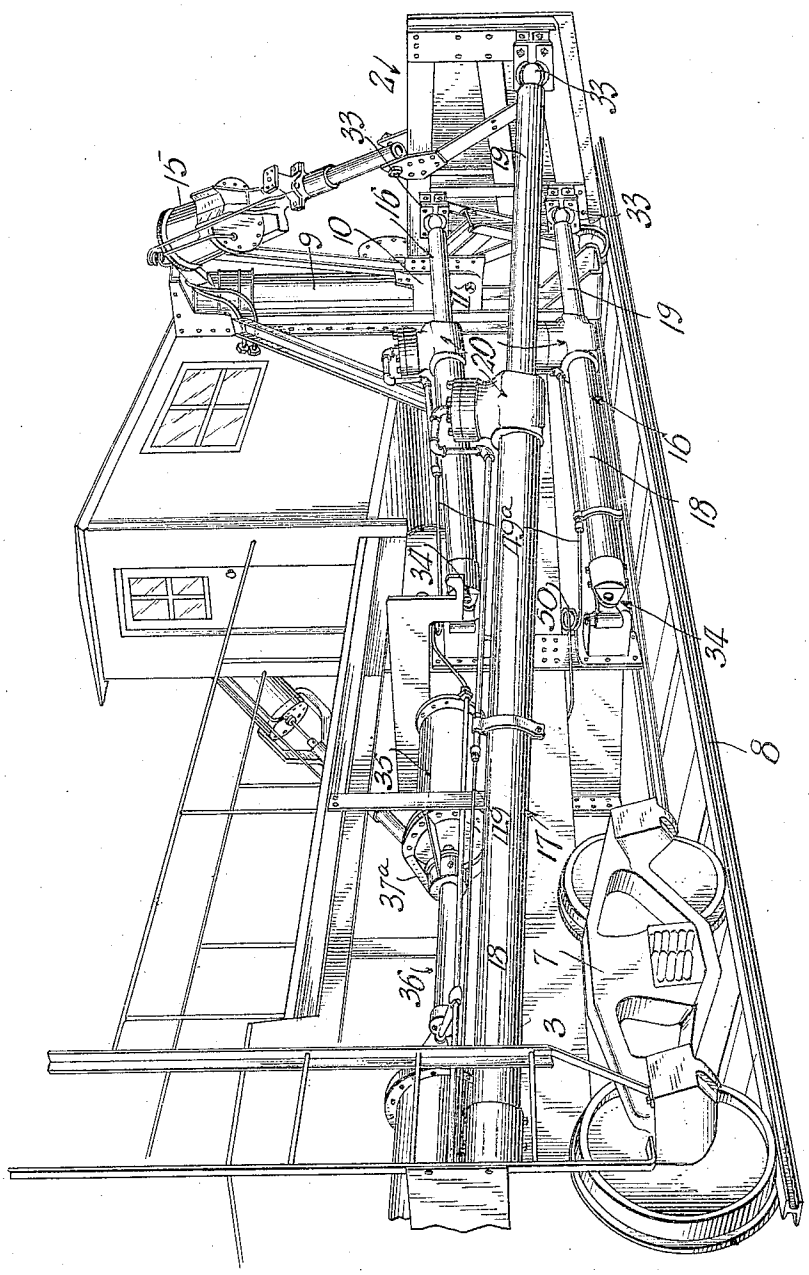


Fig. 2.

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Aug. 2, 1932. H. W. PROTZELLER 1,869,774

RAILROAD SPREADER

Filed Feb. 23, 1929 3 Sheets-Sheet 3

Fig. 3.

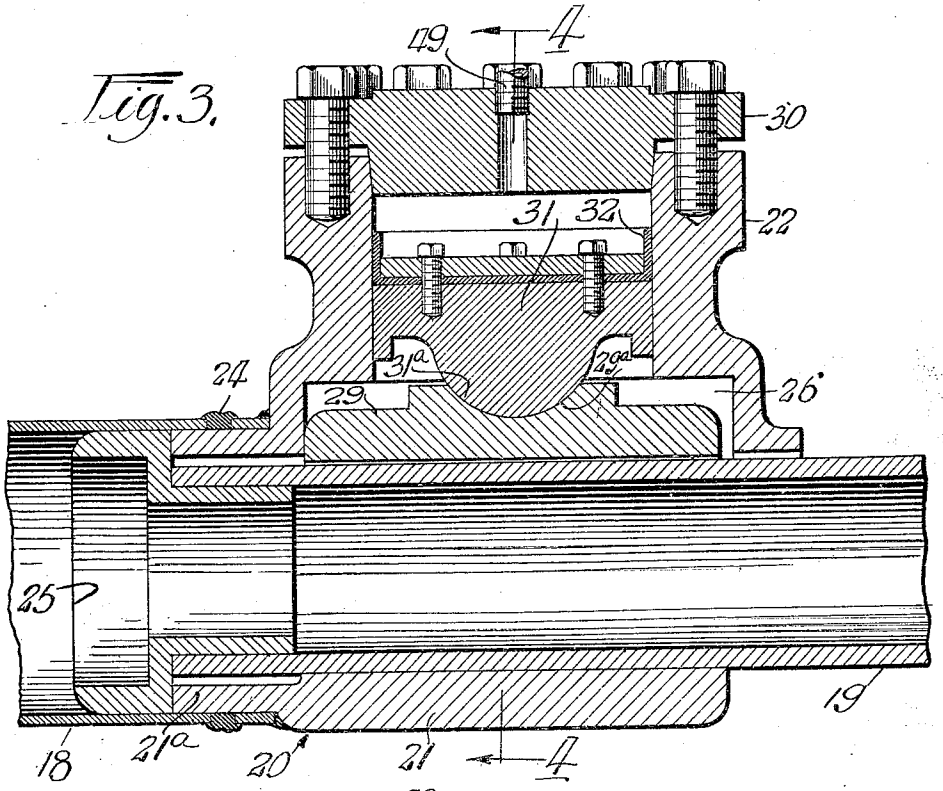
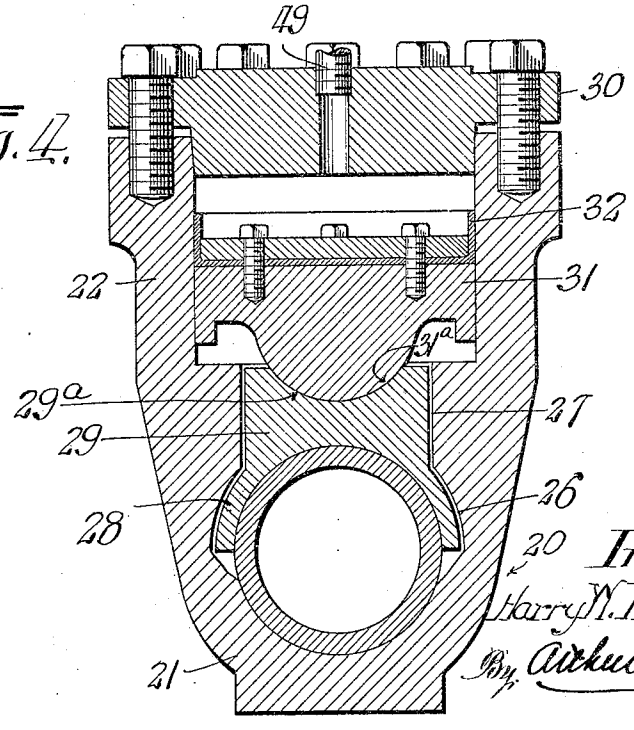


Fig. 4.



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UNITED STATES PATENT OFFICE

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RAILROAD SPREADER

Application filed February 23, 1929. Serial No. 341,926.

This invention relates to improvements in railroad spreaders and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The primary object of the invention is to provide in a railroad spreader, an improved telescopic brace construction between the spreader wing and car which includes hydraulic means for locking the parts of the brace in the desired extended position.

A further object of the invention is to provide such a construction, which in no manner interferes with the relative turning of the brace parts during the changing of the vertical angular position of the wing and one which will hold the brace extended against any load imposed against the wing, met with in the condition of use.

These objects of the invention, as well as others together with the many advantages thereof will more fully appear as I proceed with my specification.

In the drawings:—

Fig. 1 is a top plan view of a railroad spreader embodying my improved form of wing brace.

Fig. 2 is a perspective view of a railroad spreader embodying my improved wing brace, as viewed toward one of the wing braces which is in its extended operative position.

Fig. 3 is a longitudinal vertical sectional view on an enlarged scale as taken on the line 3—3 of Fig. 1.

Fig. 4 is a detail longitudinal vertical sectional view through the brace bar parts locking mechanism as taken on the line 4—4 of Fig. 3.

Fig. 5 is a longitudinal sectional view through a hydraulic ram employed with each set of braces.

Referring now in detail to that embodiment of the invention illustrated in the accompanying drawings, 1 indicates as a whole the car of a railroad spreader and 2—2 indicate the main spreader or side wings, arranged one at each side of the car. In Fig. 1 the decking of the car has been omitted for the purpose of more fully showing the underframing thereof.

The underframing includes side sills 3—3 suitably connected together and extending from end to end of the car. At the front end of the car and spaced outwardly from the side sills are shorter sills 4—4 thus providing a wider frame or platform 5 at said end of the car which is pointed in the usual manner to accommodate the associated V-shaped front plow 6.

At each end of the frame is provided a wheeled truck 7 by means of which the car may be moved upon the rails of a railroad track 8. The construction just above described provides a substantially arrow-shaped car body with wider front end and a narrower part to the rear thereof, against which the wings 2—2 are disposed when the car is in transit from one point of use to another.

At each side of the car, a suitable distance to the rear of the wider front platform part 5 is an upright wing carriage post 9 suitably secured to and supported from the side sills. Each post is preferably tubular and mounted thereon for a vertical guided movement is a hinge bracket plate 10. Said bracket plate is bifurcated to receive the inner end of a wing 2 and said wing is hinged in the bracket plate by a horizontal pin 11. Suitably connected to each post is an arm 12 the free end of which is connected to a piston 13 of a compressed fluid cylinder 14 carried on the car underframing as best shown in Fig. 1. As is apparent in said figure, each cylinder is disposed on that side of the car opposite the one upon which its associated wing is located. Thus when fluid under pressure is admitted to one end of a cylinder, it will swing the associated wing about the carriage post away from the car as best shown at the bottom of Fig. 1 and when fluid under pressure is admitted to the other end of said cylinder the wing is swung in toward the side of the car as best shown at the top of said Fig. 1. As the construction just described will form the subject matter of a separate application to be filed later, it will not be described in more detail herein.

With each wing there is associated a power cylinder 15 by which the wing may be swung into different vertical angular positions about the pin 11 which connects the inner end of the

wing to the bracket plate 10. From the above, it is apparent that the wing may be readily swung from an inoperative position parallel with the cut in sides of the car to an operative position at an angle thereto and that when said wing is in its operative position its outer end may be swung up or down to give the desired vertical angularity thereto.

Associated with each wing is one or more braces, the function of which is to hold the wing at the desired angular position with respect to the car and to receive the thrust or load imposed upon the wing in service and to transmit it to the underframing of the car. As shown in Fig. 2 I provide a pair of inner braces 16 and an outer brace 17 for each wing and as all of said braces are substantially alike in structure and only differ in length, a detailed description of one, will suffice for all. Each brace includes inner and outer tubular members or pipes 18 and 19 respectively. In this instance the inner pipe member 18 is of a larger diameter and on the outer end thereof is fixed in a clamp guide block or casting 20 which includes a barrel portion 21 and a cylinder portion 22 arranged at a right angle thereto on the top side thereof. One end 21^a of the barrel portion is reduced in diameter to fit within the end of the pipe 18 and said end of the pipe is provided with perforations through which said end 21^a of the barrel portion is welded thereto as indicated at 24 in Fig. 3.

The associated end of the pipe 19 bears upon the bottom part of the barrel portion and has fixed to its extremity, a collar 25 which has a snug sliding fit within the interior of the pipe 18. In the top side of the barrel portion is a chamber 26 which communicates with the bore of the cylinder by a vertically disposed groove 27. In the chamber is located a semi-cylindrical shoe 28 and the bottom surface thereof is concaved to fit over that portion of the pipe 19 within the chamber. On the top of said shoe is a rectangular boss 29 which has a somewhat loose sliding guided fit in the groove 27 and in said boss is formed a concaved recess 29^a.

The open top end of the cylinder 22 is closed by a head 30 and slidable within the cylinder is a piston 31. On the top of the piston is secured a cup leather or gasket 32 and on the bottom of the piston is formed a hemi-spherical boss 31^a to seat within the recess 29^a in the shoe boss 29. This construction provides a ball and socket like engagement between the piston and shoe so that while the shoe may "float" to a certain extent on the pipe 19, an operative engagement between the piston and shoe will always take place when the piston forces the shoe into engagement with the pipe 19.

The outer or free end of the pipe 19 has a ball and socket joint connection with the rear side of the wing as indicated as a whole at 33 in Fig. 1 while the inner end of the pipe 18 has a universal joint connection with the underframing of the car as indicated at 34 in said figure. The ball and socket joint connection 33 is such as will permit a turning movement of the pipe 19 with respect to the wing without separation therebetween, while the universal joint connection 34 is such as will permit the brace as a whole to swing in toward or out away from the car as well as to swing upward and downward. Said universal joint, however, will not permit a turning or twisting of said pipe 18 with reference to the car underframing.

On the rear end of the car is located means for delivering hydraulic pressure to the cylinder 22 of each brace and such means is as follows: 35—35 indicate a pair of fluid pressure cylinders disposed longitudinally of the car near the rear end thereof and fixed to the underframing in any suitable manner, there being one cylinder provided for the braces 16 and 17 respectively of each wing. Each cylinder 35 has associated with it a hydraulic ram indicated as a whole at 36, The cylinders 35—35 are offset longitudinally on the car underframing for the purpose of saving space and the ram of one cylinder is directed forwardly and the ram of the other cylinder is directed rearwardly as best shown in Fig. 1. As the construction of each cylinder and its ram is the same, a detailed description of one will suffice for both.

Each cylinder 35 is closed at its ends by heads 37 and 38 respectively. Fixed to the head 37 is a spider 37^a to which one end of the barrel 39 of the ram is secured, in a manner supporting the ram from the cylinder, the other end of said barrel being closed by a cap 40. In the cylinder 35 is a piston 41 carrying oppositely facing cup leathers or gaskets 41^a—41^a and to said pinion is secured a piston rod 42. Said rod slides through a stuffing box or packing 43 in the spider and extends into the barrel 39 of the ram to act as the plunger thereof. As the cylinder 35 and the barrel are of different diameter, it is apparent that great pressure may be developed in the barrel when the piston moves in one direction, oil being used in the barrel as the hydraulic medium. To fill the barrel with oil a plug 39^a is provided in the top side of said barrel.

Fixed in the cap 40 is one end of a pipe nipple 44 the other end of which carries an elbow fitting 45. Depending from the elbow is a pipe section 46 connected by a T fitting 47 to branch pipes 48—48^a, one for the cylinder 22 of each wing brace 16 and 17. A conduit 49 connects the branch pipe 48 with the head 30 of the cylinder 22 of the brace bar 17, while a conduit 49^a connects the branch pipe 48^a with the head of each of the cylinders 22 associated with the pair of the

brace bars 16. Preferably the conduits 49 and 49ª are made of copper tubing and in each conduit is formed a "pig tail" or a plurality of helical loops 50. The "pig tail" of one conduit is disposed above the universal joint 34 connecting its associated brace to the car while the "pig tail" of the other conduit is disposed above the universal joint connecting its associated brace to the car This "pig tail" which is best shown in Fig. 2 provides that flexibility in said conduits to accommodate for the various movements of the wings and braces in actual service and eliminate the use of swing joint fittings therein which cannot hold the great internal pressures necessary without leakage.

The heads of each cylinder 35 are connected by suitable valved pipes 37ˣ and 38ˣ (see Fig. 1) by which air under pressure may be admitted to the desired end of the cylinder 35 to move the piston thereof in either direction under power.

On the car underframing, to the rear of the wing posts 9—9 is located a container or tank 51 for air under pressure as best shown in Fig. 1, to which the pipes 37ˣ and 38ˣ respectively are connected but for the sake of clearness the piping from said tank to the cylinders is omitted from Fig. 1 of the drawings.

The operation of the mechanism above described is as follows:—

Assume that both wings are folded in toward the car as shown at the top of Fig. 1. When it is desired to swing one of the wings into an operative position as shown at the bottom of Fig. 1, air under pressure is admitted to the proper cylinder 14 which through the associated arm 12 will swing said wing into its operative position about the associated wing post 9 as an axis. In this movement of the wing, the pipe section 19 will slide in the pipe section 18, it being understood that the hydraulic medium in the rams 36 is not under pressure in the various cylinders 22—22 and therefore there is no gripping or clamping of the associated shoes upon said pipe sections 19.

When the desired operative angular position of the wing has been reached, air under pressure is admitted through the pipe 38ˣ to one end of the associated cylinder 35 to move the piston thereof toward the other end of the cylinder, the other pipe 37ˣ being open at this time to atmosphere. As the piston moves outwardly of the cylinder, it moves inwardly with respect to the barrel 39 of the ram 36 with the result that the medium (oil) within the same is placed under great pressure and passes out of the barrel in this condition through the conduits 48 and 48ª to the cylinders 22 of each brace bar. With the oil under pressure in said cylinders 22—22 the pistons 31 in said cylinders will move downwardly and will force the associated shoes 29 into a tight clamping engagement with the pipe section 19 and thus lock the pipe section 19 to the pipe section 18.

It has been demonstrated in actual use that by hydraulically forcing the shoe into engagement upon the pipe section 19 as described, the brace may be held in its extended condition under far greater load strains imposed upon the wing than was hereto possible to hold with the pin and hole type of lock heretofore employed. Should the wing tend to float up or down due to the uneven surfaces operated upon, or if it becomes necessary to change the vertical angle of the wing for any reason, this is readily possible after unlocking the pipe section 19 and should the said pipe section turn during this operation, it will in no manner interfere with the relocking because no registration of locking pin and hole need be taken into consideration.

When it is desired to swing the wing back into its inoperative position alongside the car, the air under pressure is shut off from the pipe 38ˣ which is then opened to atmosphere and air is admitted to the other end of said cylinder 35 by means of the pipe 37ˣ. Thus the piston therein moves toward the other end of said cylinder 35 and draws the piston-plunger rod in the other direction in the ram barrel. This sucks the hydraulic medium out of the cylinder 22 back into the ram cylinder and releases the pressure on the pistons 31 and shoes 29 so that the pipe sections 19 are free to slide in the pipe sections 18 and thus telescope and foreshorten as is necessary.

As the concaved pipe engaging surface of the shoe wears down, this wear is automatically taken up or compensated for by the movement of the pistons 31.

The construction described has many advantages. It securely holds the brace in its extended position under extreme loads and the brake shoe grips or clamps upon any portion of the pipe section 19. Again the number of parts are reduced to a minimum so that labor and material cost is greatly decreased.

While in describing the invention I have referred in detail to the form, arrangement and construction of the various parts thereof, the same is to be considered merely as illustrative so that I do not wish to be limited thereto except as may be specifically set forth in the appended claims.

I claim as my invention:—

1. In combination with inner and outer telescopic elements, a member on one end of the outer element and through which the other element is longitudinally movable, a device having guided engagement and movable in said member toward and away from said inner element, and a hydraulically actuated piston also movable in said member and engaged

with said device to move it into engagement with said inner tubular element said device and piston being formed with interengaging parts that normally permit a rocking movement between them.

2. In combination with inner and outer telescopic elements, a member on one end of the outer element and through which the other element is longitudinally movable, a device movable in said member toward and away from said inner tubular element, a hydraulically actuated piston also movable in said member and means providing a ball and socket engagement between said piston and said device.

3. In combination with inner and outer telescopic elements, a member on one end of said outer element and through which the other element is longitudinally slidable, said member including a cylinder disposed at a right angle to the axes of said telescopic elements, a shoe in said member and formed at one end to partially embrace said inner element and having a boss at its other end and a hydraulically actuated piston in said cylinder, and having a hemispherical portion engaging in a similarly formed recess in the boss on said shoe.

4. In combination with a pair of coacting tubular members capable of a relative turning as well as a relative telescopic movement, a hydraulic engine mounted on one of said members and including a hydraulically movable part and a gripping device associated with said engine normally engaged with the other of said members and adapted to be moved by said movable part of said hydraulic engine to powerfully grip said other member to lock said members in the desired relative position said gripping device and engine including parts so formed as to permit a limited rocking movement between them.

5. In combination with a pair of coacting telescopic elements, a member carried on one end of one of said elements and formed to provide a hydraulic cylinder arranged at substantially a right angle to said elements and a chamber through which the other element is longitudinally movable and hydraulically actuated means in said cylinder and chamber respectively for engaging that portion of said other element passing through said chamber with a clamping action.

6. In combination with a pair of telescopic brace members having interfitting end portions, means providing a hydraulic engine on one of said members and including a piston movable in a direction at a right angle to the axis of said brace members and a gripping block engaged at one end with the other of said brace members and adapted to be engaged at its other end by said piston to powerfully grip said last mentioned member to lock said telescopic members in the desired relative position.

7. In a device of the kind described, a pair of coacting telescopic members, one of which is reinforced at one end and the other of said members interfitting with said reinforced portion, said reinforcing portion including a cylinder disposed at a right angle to the axis of said telescopic members, a hydraulically actuated piston in said cylinder and a gripping block engageable by said piston and movable into gripping relation upon said other of said telescopic members to lock said telescopic members in the desired relative relation.

8. In combination with a pair of coacting tubular brace members capable of a relative turning as well as a relative telescopic movement, a hydraulic engine carried by one of said members and including a cylinder arranged at a right angle to the axis of said members, a piston in said cylinder and a gripping jaw actuated in one direction thereby to powerfully grip the other of said members to lock them in the desired relative position.

In testimony whereof, I have hereunto set my hand, this 18th day of Feb., 1929.

HARRY W. PROTZELLER.