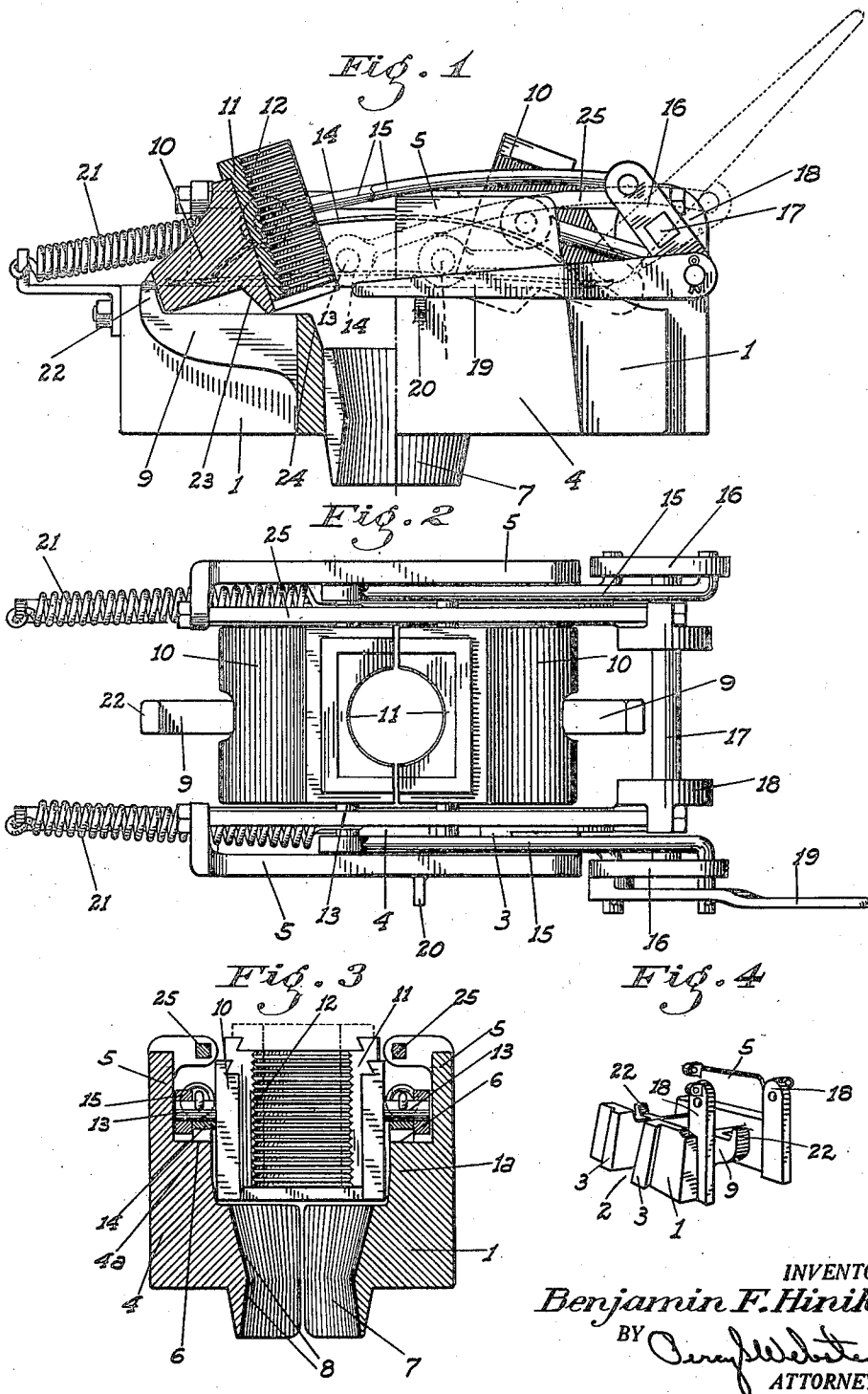


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 LOCKED CARRIAGE PIPE SPIDER.
 APPLICATION FILED AUG. 7, 1920.

1,375,964.

Patented Apr. 26, 1921.



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LOCKED-CARRIAGE PIPE-SPIDER.

1,375,964.

Specification of Letters Patent.

Patented Apr. 26, 1921.

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To all whom it may concern:

Be it known that I, BENJAMIN F. HINIKER, a citizen of the United States, residing at Taft, county of Kern, State of California, have invented certain new and useful Improvements in Locked-Carriage Pipe-Spiders; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in well drilling machinery and equipment, and particularly to the pipe holding devices, being an improvement over Letters Patent No. 1,273,858, issued to me July 30th, 1918.

The principal object of the present invention is to provide a structure of this character in which the driving bushing shown in the aforementioned patent is eliminated, and the entire structure simplified and rendered more efficient.

I now provide a pair of semicircular jaws or clamps to engage the pipe, which gives a much firmer grip and I am also enabled to use a variety of sizes of jaws to fit various sizes of pipe without changing or removing the spider.

All parts of the structure are connected together, so that the chances of any such becoming lost are reduced to a minimum. At the same time certain parts are readily removable so that the spider as a whole may be removed or installed while the pipe is in the well.

I have also provided a double action lever control for the locking carriages which will give ample clearance for the couplings on the pipe.

In all, I have provided a mechanically operated spider which is designed for ease of operation, speed and safety.

The folding lever construction allows the springs to operate all parts when connecting or unjointing the pipe. Also the carriages and bushings cannot rotate, and the contour of the pipe is better preserved by the use of semicircular bushings than by the use of the three or four slips commonly employed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings, similar characters of

reference indicate corresponding parts in the several views.

Figure 1 is a side elevation of the device, one half being in section, showing the jaws 60 unlocked.

Fig. 2 is a top plan view thereof, the jaws being in their clamping position.

Fig. 3 is a central cross-section of the device.

Fig. 4 is a perspective view of the main frame or supporting member, detached.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes a rigid block or frame forming the base or table, provided with a central opening 2 on one side, on each side of which are tapered and beveled guides 3 adapted to seat in corresponding grooves formed in a side member 4 to hold the latter against downward and lateral movement. These members when assembled form a complete and compact supporting unit for the locking carriage structure hereinafter described.

Both members are provided with outer and upwardly projecting walls 5 or protectors, and these being thinner than the main walls of the table, leave longitudinal and horizontal shelves 6 at their junction with said main walls.

Positioned centrally of the members 1 and 4 and formed one half with each of them, is a cylindrical and vertical guide sleeve 7, whose inner surface has a double or reverse taper from the ends inwardly toward the middle as shown at 8.

Projecting parallel to the members 1 and 4 and extending from each end of the sleeve 7 and somewhat above the same are horizontal ribs 9 forming a support for carriages 10 which are slidable thereon between the main walls 1^a and 4^a of the members 1 and 4 respectively.

These carriages face each other, and their adjacent faces are arranged to be fitted with bushings or jaws 11, a pair of which together form a complete circle and are adapted to engage a pipe. To further this end, their inner surfaces are horizontally and sharply grooved throughout so as to form sharp teeth as at 12. These teeth and semicircular faces may be formed on the carriages themselves, but the bushings are preferable.

These jaws are preferably dove-tailed into the carriages, and other and smaller bush-

ings may be similarly nested into the largest sized bushing if desired to accommodate different sized pipes.

On each side of the carriages are pins 13 extending to the protectors 5, which rest on leak springs 14, riding on the shelves 6. These pins are positioned on the carriages so as to be forward of the center of gravity thereof relative to the end opposite the springs, so that the normal action of the springs is to cause the carriages to assume a tilted position, with the bushings spread apart and slanting upwardly and away from each other, the rear ends of the carriages resting on the ribs 9 as shown in Fig. 1.

On the pins are mounted the ends of connecting rods 15 which extend to the opposite ends of cross heads 16 fixed on a shaft 17 turnably mounted in bearing lugs 18 formed with the member 1 at one end thereof.

A lever 19 is turnably mounted on the lowermost rod 15 at the point where it projects through the adjacent crosshead, this handle being adapted to bear when raised against the similarly protruding end of the other rod 15 on the same side. Thus by pulling up on said lever, the bars are moved in opposite directions, the connections being such that the lowermost bar is connected to the nearest carriage, while the upper bar passes to the farther carriage. On manipulating the handle therefore, as stated, the carriages are moved together until their jaws clamp about a pipe centered in the table.

When thus positioned, the movement of the lever may be reversed without disturbing the setting of the carriages, and may be lowered alongside the protector or wall 5 and rest on a lug 20, so that it is then out of the way.

I call the members 5 protectors for the reason that in any setting of the carriages the pins and connecting rods are always below the level of the same and therebehind, so that they cannot be harmed by outside obstructions.

Coil springs 21 are connected to the carriage farthest from the handle and to the table 1, so as to pull the carriages away from each other and aid the action of the springs 14 in this respect, the ribs 9 having upstanding lugs 22 on their outer ends against which the carriages abut to prevent further movement thereof.

The carriages lock on the pipe not only by means of the control-lever mechanism, but by reason of the fact that behind the bushings they are provided with beveled faces as at 23 sloping downward toward said bushings, which when moved forward, engage similarly beveled faces 24 formed on opposite sides of the sleeve 7 and thereabove.

Thus, when the said corresponding faces engage, by reason of the manipulation of the lever 19, and the pipe is clamped, if the weight of the pipe is then allowed to be sustained by the spider, the carriages will wedge firmly into place, and the greater the weight the greater will be the wedging and clamping action had.

Above the pins 13 and beyond the plane of the connecting rods, bars 25 extend lengthwise of and parallel to the protectors, and in themselves are a form of protector, being so positioned that said pins may have all necessary freedom of movement without interference therewith and of a strength sufficient to enable the entire spider to be raised thereby. They are removably mounted to the members 1 and 4 by any suitable means.

The clamping of the pipe, as hereinbefore stated, is had first by means of the hand lever and then by the wedging action of the carriages in the table as the weight of the pipe is taken hereby. When conditions are reversed, that is when the pipe is lifted, the action of the springs 14 and 21 automatically expand the jaws of the carriages, without disturbing the at-rest position of the lever, the former springs bearing equally on the pins of both carriages, causing them to both rise evenly and disengage the pipe simultaneously. When the carriages are thus moved to their farthest apart position, there is room for the pipe or the table to be moved laterally of each other. To remove the spider, the member 4 is first removed which removes half of the guide sleeve 7 at the same time and exposes the connecting rods and pins, on that side, which may then be disconnected from each other and the spider withdrawn from around the pipe.

From the foregoing description, it will be readily seen that I have produced such a device as substantially fulfils the objects of the invention as set forth herein.

While this specification sets forth in detail, the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to and do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A device of the character described comprising a table, a pair of carriages slidably mounted therein for movement to and from each other, and semicircular bushings carried by the carriages and arranged to clamp about a pipe when the carriages are moved toward each other.

2. A device of the character described comprising a table, a pair of carriages slid-

ably mounted therein for movement to and from each other, semicircular bushings carried by the carriages, and hand actuated means for moving the carriages in unison to clamp the bushings about a pipe.

3. A device of the character described comprising a table, a pair of carriages slidably mounted therein for movement to and from each other, semicircular bushings carried by the carriages, hand actuated means for moving the carriages to clamp the bushings about a pipe, and means whereby when the pipe is then lifted relative to the table the bushings will be automatically disengaged from the pipe.

4. A device of the character described comprising a table, a pair of carriages slidably mounted therein for movement to and from each other, semicircular bushings carried by the carriages, and a guide sleeve formed with the table below the bushings to center a pipe relative thereto.

5. A device of the character described comprising a table, a pair of carriages slidably mounted therein for movement to and from each other, semicircular bushings carried by the carriages, pins on the carriages on each side thereof, rods connected to said pins, a common means connected with said rods for moving said carriages toward each other to cause the bushings to clamp about a pipe, and leaf springs bearing on the table and on which the pins rest.

6. A device of the character described comprising a table, a pair of carriages slidably mounted therein for movement to and from each other, semicircular bushings carried by the carriages, hand actuated means for moving the carriages to clamp the bushings about a pipe, and spring means cooperating with the carriages for automatically causing the bushings to spread and disengage the pipe when the latter is raised relative to the table.

7. A device of the character described comprising a table, a pair of carriages slidably mounted therein for movement to and from each other, semi-circular bushings carried by the carriages, pins on the carriages on each side thereof, means connected to said pins for moving the carriages toward each other to cause the bushings to clamp about a pipe and springs bearing against the table and pressing upwardly against the pins, the latter being positioned closer to each other than the lines of the centers of gravity of the carriages, whereby the latter will tilt backward and away from

the pipe when the springs are free to exert their upward pressure.

8. A device of the character described comprising a table, a pair of carriages slidably mounted therein for movement to and from each other, semicircular bushings carried by the carriages, hand actuated means for moving the carriages in unison to cause them to engage a pipe, and cooperating means between the table and carriages for causing the latter to engage said table with a wedging action relative to the pipe when the weight of the latter is supported by the table.

9. A device of the character described comprising a table, a pair of carriages slidably mounted therein for movement to and from each other, semicircular bushings carried by the carriages, hand actuated means for moving the carriages in unison to cause them to engage a pipe, beveled faces on the carriages under the bushings and parallel to the faces thereof, and similarly beveled faces on the table, said faces being adapted to engage each other after the carriages have moved together a predetermined distance, said faces slanting downwardly and toward the plane of the center line of the bushings.

10. A device of the character described comprising a table having a central orifice to receive a pipe therein, a pair of oppositely disposed carriages slidably mounted on the table for movement to and from each other and carrying bushings arranged to engage the pipe, and a removable side member on the table forming a closure for one side of said orifice, whereby on removing said side member the table may be withdrawn from around the pipe, the carriages being arranged to move apart a distance greater than the diameter of the pipe.

11. A device of the character described comprising a table, a pair of carriages slidably mounted therein for movement to and from each other, semicircular bushings carried by the carriages, pins on the carriages on each side thereof, rods connected to said pins, a common means connected with said rods for moving said carriages toward each other to cause the bushings to clamp about a pipe, leaf springs bearing on the table and on which the pins rest, and side walls projecting upwardly from the table outside the springs and pins and protecting such mechanism.

In testimony whereof I affix my signature.
BENJAMIN FRANKLIN HINIKER.