R. A. LINCOLN.

PIPE CLAMPING DEVICE.

APPLICATION FILED NOV. 17, 1914.

1,150,870. Patented Aug. 24, 1915.

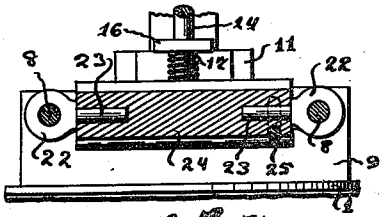


Fig. 5.

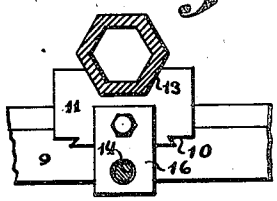


Fig. 6.

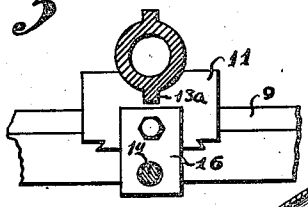


Fig. 7.

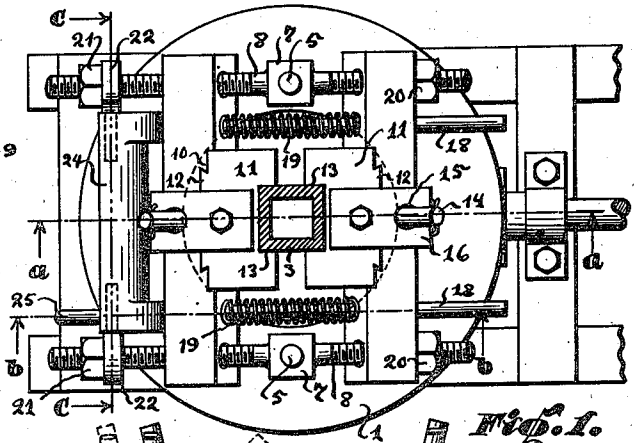


Fig. 1.

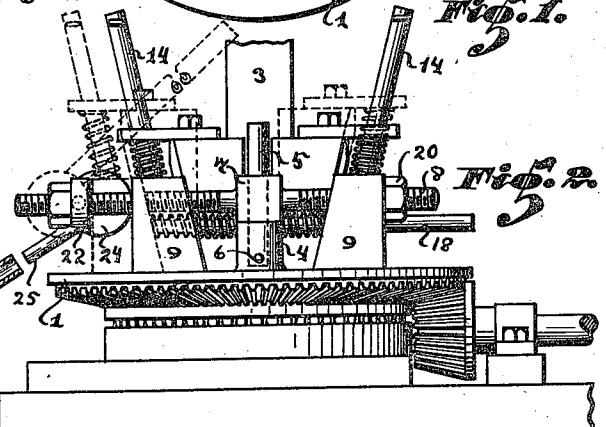


Fig. 2.

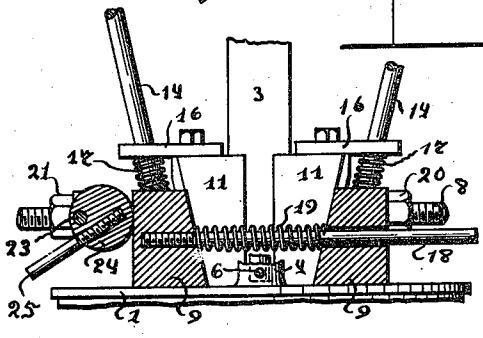


Fig. 4.

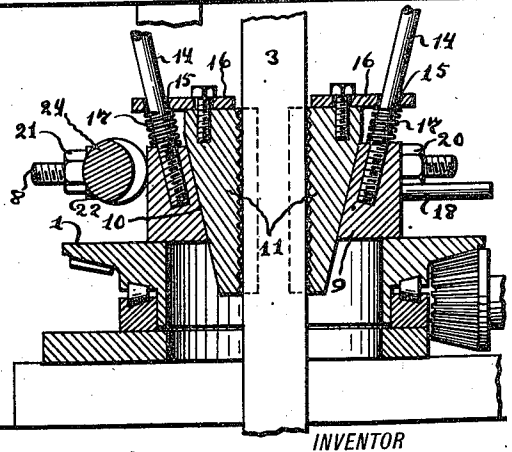


Fig. 3.

WITNESSES:

C. A. Ellis

R. C. Bruckner.

INVENTOR

R. A. Lincoln

BY

John McDougall.

ATTORNEY

UNITED STATES PATENT OFFICE.

ROBERT A. LINCOLN, OF ELECTRA, TEXAS.

PIPE-CLAMPING DEVICE.

1,150,870. Specification of Letters Patent. Patented Aug. 24, 1915.

Application filed November 17, 1914. Serial No. 872,504.

To all whom it may concern:

Be it known that I, ROBERT A. LINCOLN, a citizen of the United States, residing at Electra, in the county of Wichita and State of Texas, have invented certain new and useful Improvements in Pipe-Clamping Devices, of which the following is a specification.

My invention relates to a new and useful pipe clamping device, and relates particularly to certain improvements upon the pipe clamping device covered by my copending application, filed Oct. 10, 1914, under Serial Number 866,178.

It is the object of my invention primarily to provide a pipe clamping device to be used in conjunction with a rotary well drilling machine to establish a rigid connection between the revoluble table of the machine and the vertical drill pipe which passes centrally through said table.

The object, stated more specifically, is to provide a pipe clamping device comprising two clamping members which are mounted upon the table of a rotary well drilling machine at each side of the central aperture through which the drill pipe is passed, the downward pull of the pipe resulting from its weight causing the two clamping members to be drawn into a firm engagement with the pipe, while drilling is in process, one of the two members being adjustable to or from the pipe so that the latter may be left free to be raised or lowered when desired without hindrance from the clamping members.

Finally, it is the object of my invention to provide a device of the character described that will be strong, durable, simple and efficient, and comparatively easy to construct, and also one the various parts of which will not be likely to get out of working order.

With these and various other objects in view, my invention has relation to certain novel features of the construction and use, an example of which is described in the following specification and illustrated in the accompanying drawings.

Figure 1 is a plan view of my pipe gripping device, showing the same coöperatively associated with a rotary drilling machine. Fig. 2 is a view of the same in side elevation. Fig. 3 is a vertical sectional view, the section being taken upon the line *a—a* of Fig. 1. Fig. 4 is a vertical section upon the line *b—b* of Fig. 1. Fig. 5 is a vertical section upon the line *c—c* of Fig. 1. Figs. 6 and 7 are respectively top views of two modified forms of clamping jaws, which may be used with my device, the jaw shown in Fig. 6 being adapted to engage a hexagonal pipe and that illustrated in Fig. 7 being formed to engage a cylindrical pipe formed with longitudinal ribs at each side.

Referring now more particularly to the drawing, wherein like reference characters designate similar parts in all of the figures, the numeral 1 denotes the circular table of a rotary well drilling machine, said table being centrally apertured in the usual manner, to give passage to a casing pipe 3.

At diametrally opposite points, adjacent to its edge, the table 1 is formed with upstanding socket members 4, respectively receiving the lower ends of vertical bars 5, positively retained in said sockets by horizontal pins 6. Upon each socket member 4, there is superimposed a square metal block 7, through which the correlated bar 5 is loosely passed. With each block 7 there are integrally formed two horizontal oppositely projecting screws 8, the end portions of which are passed loosely through corresponding extremities of two horizontally elongated guide blocks 9, which rest upon the table 1 at each side of the pipe 3, and in a symmetrical relation to said pipe. The opposing faces of the blocks 9 have a slight convergent downward inclination, and each of said faces is formed with a shallow guide-way 10, extended from top to bottom of the block midway between the ends of the same. Each block 9 constitutes a support for a slidable pipe clamping member 11, formed upon its rear face with a wide tongue 12 extending from top to bottom of the member, the lateral edges of said tongue being flared, each tongue 12 being engaged within the guide-way 10 of the correlated block 9, and being retained therein, through the engagement of the flared edges of the tongue beneath the over-hanging edges of the guide-way. The opposing faces of the clamping members 11 are formed with similar vertical channels 13, which when using a drill pipe of square cross-section, will have the rectangular form illustrated in Fig. 1. When a hexagonal drill pipe is being used, the channels 13 will take the form illustrated in Fig. 6, and in case the drill pipe is of a cylindrical form having opposite exterior longitudinal ribs, the channels 13 will be as shown in Fig. 7,

arcuate in cross-section and formed with a central vertical groove 13a. Preferably several sets of the clamping members 11 will be provided with my device, which sets will differ as to the form of the channels 13, the sets being interchangeable for use with my invention, and adapting my device to be used with drill pipe of any commonly used form.

Midway between the ends of each member 9, a guide bar 14 projects rigidly upward from the same, with an inclination paralleling that of the correlated guide-way 10. Each bar 14 passes freely through an orifice 15, formed in a metal plate 16 horizontally projecting from the adjacent clamping member, and bolted rigidly to the same. Between each block 9 and the plate 16 overhanging the same, there is interposed a spring 17, coiled upon the correlated bar 14, said spring having sufficient strength to support the correlated jaw in the elevated position illustrated in dash lines in Fig. 2, when no force is acting downwardly upon the jaw, sufficient to put the spring under compression. When the two jaws or clamping members are raised as illustrated, they occupy positions closely adjacent to the pipe but do not clamp the same.

Through one of the blocks 9, there are loosely passed two bars 18, equidistant from the drill pipe at each side of the same, each of said bars having one of its extremities rigidly engaged with the other block 9 (see Fig. 4). Between the two blocks 9, there is coiled upon each bar 18 a spring 19, under sufficient compression to tend to force the two members 9 apart. The block 9 through which the bars 18 are passed loosely is maintained by the springs 19 firmly pressed against nuts 20 repectively mounted upon the screws 8. The other block 9 is adjustable to or from its mate, as will now be explained.

The screws 8 which pass through the adjustable member 9 carry respectively upon their extremities nuts 21, which act as stops to limit the displacement of collars 22, respectively mounted upon the screws 8. From the collars 22, pivot pins 23 project toward each other engaging eccentrically in the extremities of an elongated cam 24, the end portions of which bear against the adjacent member 9. Between its end portions, the cam 24 is cut away, as shown in Fig. 1, thus reducing its weight. A heavy pin 25 projects rigidly from the cam 24, in an approximately radial direction, and is adapted to be engaged within one end of a pipe 26 which will serve as a lever whereby to rotate the cam. According as the cam 24 is adjusted to bring its greatest or least radius adjacent to the member 9, the distance between the two members 9 will be a minimum or maximum. Both limiting positions of the adjustable member 9 are illustrated in Fig. 2, one in full lines and the other in dash lines.

The structural features of my invention having been above fully described, an explanation as to the operation of the same will now be given. When drilling is in process, the adjustable member 9 will occupy the limiting position illustrated in full lines in Fig. 2 in which position, said member will be a minimum distance from the drill pipe. Under these conditions, the weight of the string of pipe will tend to subject the two clamping members to a downward displacement, which will tend to decrease the distance intervening between them and hence will cause them to grip the pipe securely. When the pipe is subjected to upward displacement, the clamping members will be freed from the strain tending to draw them toward each other, and they will be elevated by the springs 17 to the positions illustrated in dash lines in Fig. 2. The pipe may now be raised freely as the members 11 are now sufficiently spaced to allow the couplings of the drill pipe to readily pass. The operator will now manipulate the lever 26 and subject the cam 24 to a rotation such as to allow the adjustable member 9 to occupy its maximum spaced relation to the drill pipe, thus creating a space between the clamping members sufficient to permit the pipe and its couplings to readily pass up or down.

The invention is presented as including all such modifications and changes as properly come within the scope of the following claims.

What I claim is:

1. In a device of the character described, the combination, of a pair of clamping members respectively disposed at opposite sides of the pipe, the opposed faces of said members being vertically channeled to engage the pipe, and the outermost faces of said members being inclined convergently downward, a pair of guide blocks formed with guide ways with which the convergent faces of the clamping members are contiguous, and means for adjusting one of said guide blocks to or from the other.

2. In a device of the character described, the combination of a pair of guide blocks mounted at each side of the pipe, a pair of sliding clamping members respectively carried by said blocks at each side of the pipe, downwardly convergent guideways being formed in the blocks to engage the clamping members, springs interposed between the blocks tending to increase the distance between the same, means permanently retaining one of the blocks against displacement due to said springs, a cam correlated with the other block, having two limiting positions of angular displacement in one of which the block is spaced a considerable dis-

tance from the pipe and in the other is close adjacent to the pipe, and means for manually subjecting the cam to rotation.

3. In a device of the character described, the combination of a pair of horizontally elongated guide blocks resting at each side of the pipe, having their adjacent faces formed with guideways inclining downwardly toward each other, a pair of clamping members respectively formed with tongues engaging in said guide-ways, and slidable in the same, springs acting upon said clamping members tending to maintain the same at a certain elevation, springs interposed between the two guide blocks, tending to force them apart, and a manually actuated mechanism correlated with one of the guide blocks, varying the extent to which the block may be shifted by said springs.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT A. LINCOLN.

Witnesses:
FRANK CLARK,
J. A. DEAKINS.