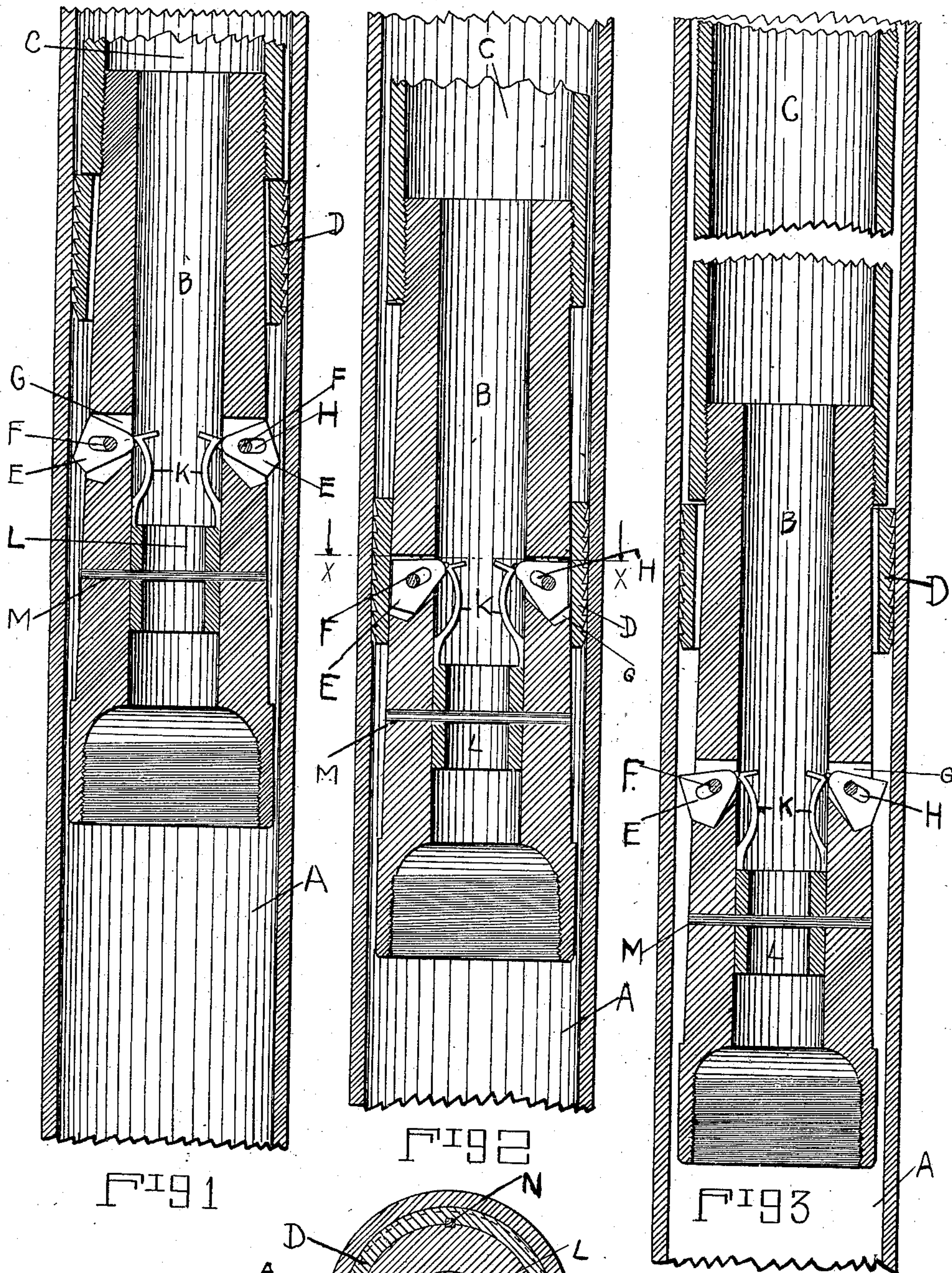


J. B. NORRIS.
WELL CASING SPEAR.
APPLICATION FILED JULY 1, 1910.

985,197.

Patented Feb. 28, 1911.



WITNESSES:
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UNITED STATES PATENT OFFICE.

JOSEPH B. NORRIS, OF CORSICANA, TEXAS.

WELL-CASING SPEAR.

985,197.

Specification of Letters Patent.

Patented Feb. 28, 1911.

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To all whom it may concern:

Be it known that I, JOSEPH B. NORRIS, a citizen of the United States, residing at Corsicana, in the county of Navarro and State of Texas, have invented certain new and useful Improvements in Well-Casing Spears, of which the following is a specification.

My invention relates to new and useful improvements in well casing spears.

In boring Artesian or oil wells it frequently occurs that a section of a well casing must be withdrawn either because of its breakage or for other reasons. In order to remove the damaged casing section, a clamping device known as a casing spear is lowered into the well, and after the casing spear has been introduced into the section of casing to be removed, an upward tension upon the casing spear causes it to clamp upon the casing so that the two may be simultaneously withdrawn from the well. In some cases, however, the section which it is desired to remove is so securely positioned in the well that it cannot be removed by this means. It then becomes desirable to detach the casing spear from the section in order that the former may be withdrawn from the well.

It is therefore the object of the present invention to provide a casing spear which may be made to clamp automatically upon a section of well casing, and which also may be automatically released from the casing if desired without the necessity of lowering any further apparatus into the well to accomplish this result.

A further object of the invention is to provide a device for this service that will be strong, durable, simple and efficient and comparatively easy to construct, and also one 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 construction and operation, an example of which is described in the following specification and illustrated in the accompanying drawing, wherein:

Figure 1 is a vertical sectional view through the axis of a section of pipe casing showing the herein-described well casing spear positioned therein, the position shown being that assumed by the parts of the device when it is first introduced into a section of casing. Fig. 2 is a similar sectional

view in which the well spear has been introduced into a casing and has been subjected to an upward tension causing the device to clamp against the walls of the casing. Fig. 3 is a similar view illustrating the position assumed by the parts of the spear when the effort to raise the pipe casing has been abandoned and the spear has been lowered in order to release the clamping means. Fig. 4 is a cross section through Fig. 2 taken on the line $x-x$.

Referring now more particularly to the drawing wherein like letters of reference designate similar parts in all the figures, the letter A designates the section of well casing which it is desired to remove from the well.

The letter B designates an upwardly tapering mandrel which forms the main body of the casing spear. The upper extremity of this mandrel is threaded to receive a section of pipe C, a plurality of which sections are connected together in order to lower the mandrel into the well. Upon the mandrel B is mounted a serrated split collar the teeth of which are arranged in annular horizontal rings with their sharp edges upwardly directed. The inner wall of this collar is tapered to fit the mandrel, the diameter of the aperture being such that the collar fits tightly upon the mandrel at its middle portion. In the middle portion of the mandrel at opposite sides thereof dogs E are pivotally mounted upon pins F. These dogs are each in a slot G in the wall of the mandrel, and each dog is provided with a slotted aperture H to receive the pin F adapting the dog to move laterally upon its supporting pin. The top and bottom surfaces of these dogs incline inwardly toward each other, and at the junction of these surfaces each dog is acted upon by a spring K. The two springs K are carried by a split collar L which is mounted within the tubular interior wall of the mandrel and is restricted from vertical displacement by a pin M. A spline N prevents rotation of the collar D upon the mandrel without interfering with its longitudinal motion thereupon.

When the casing spear is first introduced into a section of casing the dogs occupy the position illustrated in Fig. 1. The collar D occupies its highest possible position relative to the mandrel B since friction between the collar and the well casing retards the collar as the mandrel moves down. When

an upward pressure is exerted upon the mandrel through the pipe sections C, the mandrel moves upward for a short period without affecting the collar D, but when the
5 mandrel reaches the position shown in Fig. 2 during its upward motion, it tightens upon the collar D and springs said collar outwardly forcing the teeth of the latter into the wall of the casing. At the same time the
10 dogs E are displaced inwardly by the collar D assuming the position shown in Fig. 2. In this position, the casing spear grips the casing more firmly as the amount of upward tension is increased. If it be found that the
15 casing section cannot be withdrawn by this means, the mandrel is again lowered into the position illustrated in Fig. 3, the dogs E being released or displaced outwardly through the action of the springs K and as-
20 suming the position illustrated in Fig. 3 with their upper edges projecting. When an upward pressure is now exerted upon the mandrel the dogs E will support the lower edge of the collar D and prevent said collar
25 tightening upon the mandrel. The casing spear therefore may be removed since the collar D will no longer act as a clamp.

It is obvious that the spring K may be
30 given other forms than that illustrated without departing from the spirit of the invention. Various other changes may be made in the details of the device without sacrificing its advantages or departing from the spirit of the invention.

What I claim is:

1. In a casing spear, the combination with an upwardly tapering mandrel, of a split collar mounted thereupon having a serrated outer surface, and having its inner surface tapered to conform with the mandrel, a dog
40 pivotally mounted in the wall of the mandrel adapted to be pressed inward by said collar when the latter tightens upon the mandrel, and a spring acting upon said dog adapted to force its upper corner outwardly
45 when released by the collar.

2. In a casing spear, the combination with an upwardly tapering mandrel, of a split collar mounted thereupon, having annular teeth upon its outer surface, and its inner
50 surface tapered to conform with the mandrel, a dog pivotally mounted in the wall of the mandrel provided with a transversely slotted aperture receiving the pivot, and a spring acting on said dog causing the lower
55 portion of the dog to project from the mandrel normally, and the upper edge thereof to project after the dog has been subjected to a partial rotation by being pressed inward by the aforesaid collar.
60

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

JOSEPH B. NORRIS.

Witnesses:

W. M. INGRAM,
F. M. RUNDELL.