

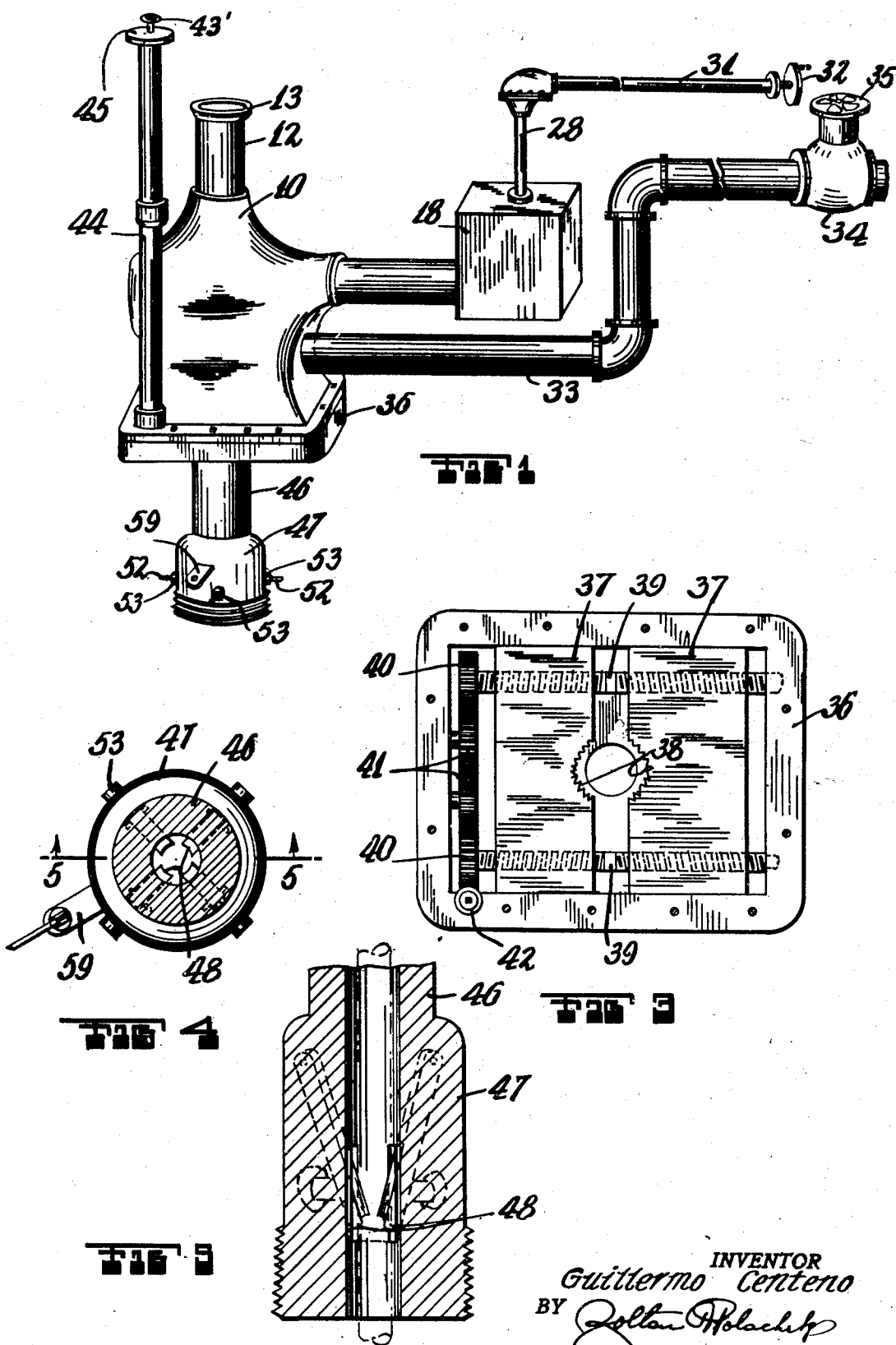
May 29, 1934.

G. CENTENO

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APPARATUS TO PREVENT PETROLEUM FIRES

Original Filed July 30, 1932 2 Sheets-Sheet 1



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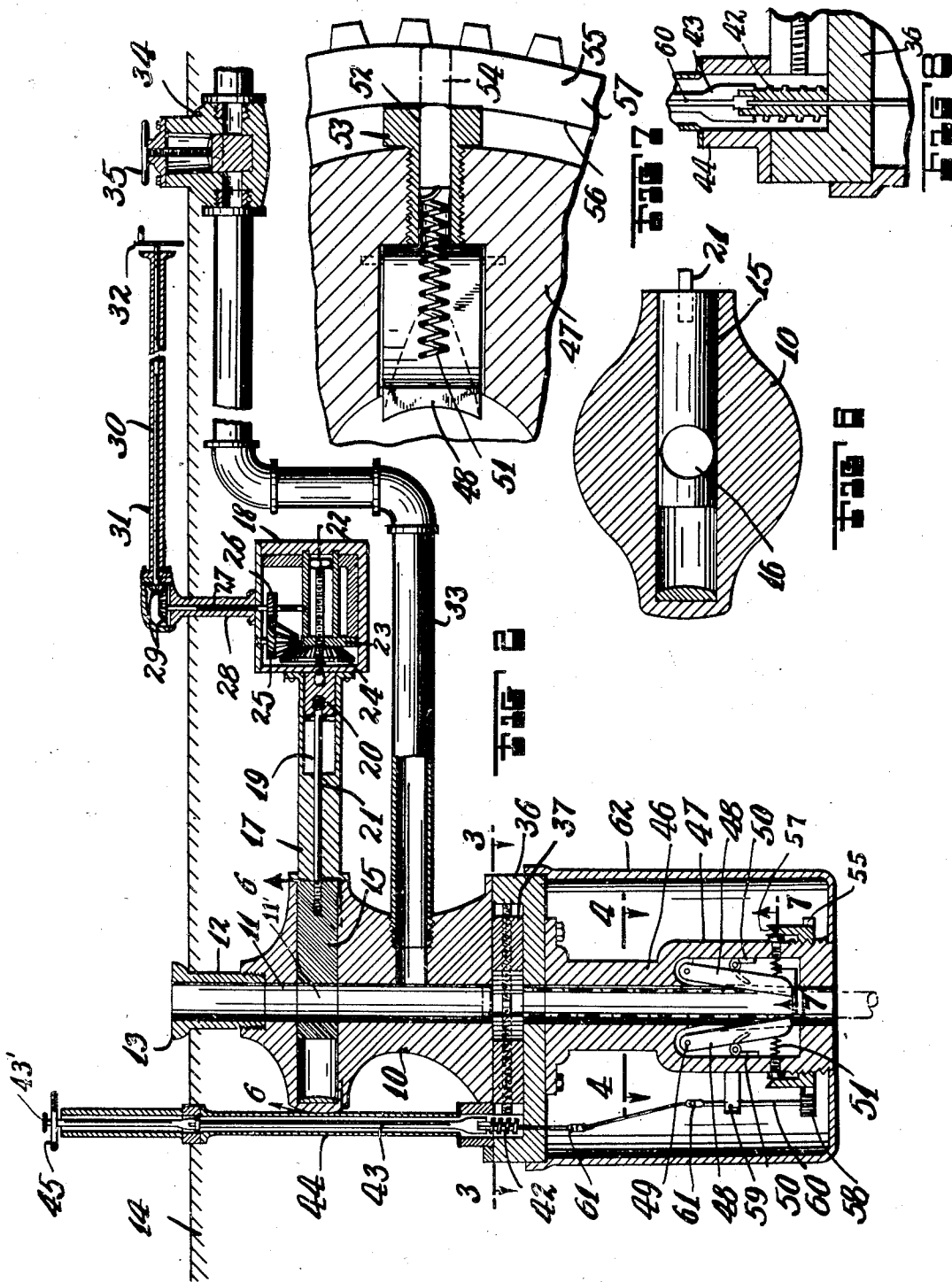
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APPARATUS TO PREVENT PETROLEUM FIRES

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3 Claims. (Cl. 166—15)

This invention relates to new and useful improvements in an apparatus to extinguish petroleum fires.

The invention has for an object the construction of an apparatus to extinguish petroleum fires which is characterized by a valve interposed in the mouth of the well or mine and associated with means for preventing explosions from throwing out drilling articles within said mouth, and means for controlling said valve from a remote point.

It is a still further object of this invention to arrange a vertical passage in said valve and a valve head which operates transversely across the passage so as to divide it into upper and lower passage portions and to connect a bypass pipe with the lower passage portion leading to a remote point where it is provided with a control valve.

A still further object of the invention is the provision of means to move the controls above mentioned from a distance of at least forty meters away.

The invention has for a still further object to provide clamp jaws to constitute the means for preventing the throwing out of the tubes above mentioned.

As a further object of this invention it is proposed to also provide clamp jaws which automatically assume a clamping position and which are resiliently mounted so as not to prohibit the insertion of the tubes.

As a still further object of the invention it is proposed to provide a means for varying the degree of resiliency of said jaws.

And as a still further object it is proposed to construct a device of the class mentioned which is of simple durable construction, dependable in use and efficient in action, and which can be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:—

Fig. 1 is a perspective view of an apparatus constructed according to this invention, shown with a lower casing and certain details removed.

Fig. 2 is a transverse sectional view of the apparatus shown in Fig. 1 with all the details in place.

Fig. 3 is a horizontal sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a horizontal sectional view taken on the line 4—4 of Fig. 2.

Fig. 5 is a fragmentary sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is a fragmentary sectional view taken on the line 6—6 of Fig. 2.

Fig. 7 is an enlarged fragmentary sectional view taken on the line 7—7 of Fig. 2.

Fig. 8 is a fragmentary enlarged sectional view of a portion of Fig. 2.

The apparatus comprises a valve body 10 with a vertical passage 11. A tube 12 is threadedly engaged in the top portion of the passage 11 and at the top has an enlarged part 13 which projects above the ground line 14. It is intended that all the apparatus illustrated in Fig. 2 below the line 14 be situated beneath the surface of the ground when the apparatus is installed. A valve head 15 is provided for closing the passage 11. This valve head is arranged transversely across the passage 11 and is provided with an opening 11' aligning with opening 11 in one of its positions and in another position being out of line so as to constitute the closed condition of the valve.

A means is provided for operating the valve head 15 from a remote point. This means is in the form of a tubular casing 17 rigidly attached upon the side of the valve body 10 and at the other end connected with a housing 18. The far end of the casing 17 is hollowed out, as indicated by reference numeral 19, and a block 20 is slidably mounted within this hollow. A stem 21 connects with the block and extends through the casing 17 and at the other end rigidly connects with the valve head 15.

A screw 22 is rotatively mounted within a transverse partition 23 supported within the box 18. A bevel gear 24 is rotatively mounted upon the partition 23 coaxially on the screw 22 and threadedly engages the screw so that upon rotation the screw moves one way or the other. The end of the screw 22 adjacent the block 20 is rotatively connected with the block.

A bevel gear 25 meshes with the gear 24 and with a spur gear 26 upon a spindle 27 extended through a tubular casing 28 projecting above the ground line 14. Bevel gears 29 connect the spindle 27 with another spindle 30 extending through a casing 31 attached upon the top end of the casing 28. The spindle 30 projects from the free end of the casing 31 and is provided with a hand wheel 32 for manual turning. It is proposed that the casing 31 and the spindle 30 be at least forty meters long so that operation of the handle 32 is possible even though a fire exists at the tubular member 13.

A bypass pipe 33 is positioned beneath the valve head 15 and connects with the portion of the passage 11 which is below the valve. This bypass pipe line extends beneath the ground to a point which is remote from the valve body

10, and at the remote point is provided with a valve 34 which has a control handle 35 extended above the ground so that the passage through the line may be opened or closed.

5 A means is also provided for preventing explosions from throwing out tubes, stones, etc. from the well or mine provided with the apparatus. This means is in the form of a flat rectangular casing 36 attached upon the bottom of the valve body 19 and slidably supporting a pair of opposed jaws 37. These jaws have serrated gripping portions 38 coaxial with the passage 11. Along opposite sides screws 39 threadedly engage the jaws 37. These screws have right hand threaded portions engaging one of the jaws and left hand threaded portions engaging the other of the jaws so that upon being rotated the jaws are moved towards or from each other. Pinions 40 are attached upon one of the ends of the screws 39 and mesh with idlers 41 so that both screws are simultaneously rotated when a worm 42 is rotated, which worm meshes with one of the gears 40. The worm 42 connects with turning tools 43 within tubular casings 44 extending to a point above the ground. A hand wheel 45 is arranged upon the top of the turning tool 43 to permit manual operation.

A tubular casing 46 is attached upon the bottom of the rectangular casing 36 and has an enlarged lower end 47. Within this enlarged end four jaws 48 are pivotally mounted. These jaws are pivotally supported at their upper ends on pintles 49 and extend downwards substantially parallel with the opening through the tubular member 46. Springs 50 are connected between the jaws 48 and the inner sides of the enlarged portion 47 of the tubular member so as to normally urge the jaws towards the axis of the bore of member 46. Other springs 51 act against the outer sides of the jaws 48 for supplementing the urging of the jaws towards the axis.

The outer ends of the springs 51 are connected with depressible pegs 52 slidably mounted within bushings 53 which are threadedly engaged into the outer sides of the enlarged portion 47. When these slidable pegs assume positions as indicated by the dot and dash lines 54 in Fig. 7, then the springs 50 solely urge the jaws as stated. When the pegs 52 are maintained inwards in the position as illustrated in full lines in Fig. 7, then the springs 51 supplement the action of the springs 50.

A ring 55 is threadedly engaged upon the lower end of the enlarged portion 47 of the casing 46 and has an enlarged inner diameter 56 so as to be capable of extending over the heads of the bushings 53. The ring 55 is also formed with a tapered portion 57 which is capable of acting against the pegs 52 so as to force them from the extended positions 54 into the retracted positions when the ring 55 is screwed upwards. A pinion 58 meshes with teeth upon the periphery of the ring 55 and is fixed upon a shaft 60 rotatively supported in a standard 59. The shaft 60 is made of several sections connected by flexible couplings 61 and passes thru the pinion 42 and the turning tools 43 to the exterior and there is provided with a handle 43'. A casing 62 is engaged over the tubular casing 46 and is attached upon the rectangular casing 36 so as to cover the mechanism upon the outside of the enlargement 47.

The operation of the device may be traced by assuming the parts in the condition as shown

in Fig. 2. Tubes or piping not shown on the drawings, may be passed through the bushing 13 and forced down into the well or mine by rotating the tubes or by impact. After a tube section has been lowered from the bushing 13 to a point in which its top end projects slightly above the jaws 37, it is then necessary that another tube be coupled with this particular tube before the tubes can be further inserted. For this reason the handle 45 should be rotated so as to cause the jaws 37 to tightly clamp the tube section just inserted. Then the new tube section may be slipped through the bushing 13 and coupled to the top end of the clamped tube section by screwing or any other coupling arrangement. After connection has been made the handle 45 is turned so as to open the jaws 37 and then further insertion of the tubes may take place by additional drilling or impacts.

The jaws 48 serve to resiliently engage at all times against the sides of the adjacent tube and serve to frictionally hold all tubes against backing up due to pressure when a well is struck or due to an explosion which may take place. Consequently the jaws 48 should be so tensioned that they exert a maximum of friction against the sides of the tube, but which friction is not great enough to hinder insertion of the tubes by drilling and impacts. The frictional engagement of the jaws 48 may be adjusted by turning the handle 43' so as to cause the pinion 58 to rotate the ring 55 so that the inclined surface 57 acts to depress the pegs 52 to desirable amounts for producing desirable tension in the springs 51.

In the event that a fire starts and the oil passing through the passage 11 is burning at the top this fire may be easily extinguished. In the past such extinguishing of such flames has been extremely hard and very expensive, but according to the instant invention the handle 32 may be turned from a remote point to cause the valve 15 to move transversely across the opening 11 and stop the flow of the oil. Consequently the fire will be extinguished. Simultaneously with moving the valve 15, the valve 35 also at the remote point, should be opened so that the flow is bypassed through the line 33 and thus does not exert undue pressure upon the well system which is liable to blow the apparatus out from the ground.

While I have shown and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

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

1. In an apparatus for preventing petroleum fires having a tubular casing with a cutoff valve operated from a distance and gripping jaws for holding tubes also operated from a distance, a tubular casing for guiding casing tubes into a well and having an enlarged lower end, jaws pivotally mounted on their upper ends in said enlarged lower end and depending downwards substantially parallel to the opening in said tubular casing, resilient means between said jaws and the tubular casing for urging the jaws towards the axis of the tubular casing for frictionally gripping casing tubes inserted through said tubular casing, radial depressible pegs extended through said tubular casing, resilient

means between said pegs and jaws, and means for depressing said pegs to various degrees for changing the resilient action on the jaws.

2. In an apparatus for preventing petroleum
 5 fires having a tubular casing with a cutoff valve operated from a distance and gripping jaws for holding tubes also operated from a distance, a tubular casing for guiding casing tubes into a well and having an enlarged lower end, jaws
 10 pivotally mounted on their upper ends in said enlarged lower end and depending downwards substantially parallel to the opening in said tubular casing, resilient means between said jaws and the tubular casing for urging the jaws to-
 15 wards the axis of the tubular casing for frictionally gripping casing tubes inserted through said tubular casing, radial depressible pegs extended through said tubular casing, resilient means be-
 20 tween said pegs and jaws, and means for depressing said pegs to various degrees for chang-
 25 ing the resilient action on the jaws, comprising a ring on said tubular casing and having a tapered upper portion, and mean for raising said ring so that said tapered portion engages over the extended ends of said depressible pegs.
3. In an apparatus for preventing petroleum

fires having a tubular casing with a cutoff valve operated from a distance and gripping jaws for holding tubes also operated from a distance, a tubular casing for guiding casing tubes into a well and having an enlarged lower end, jaws
 80 pivotally mounted on their upper ends in said enlarged lower end and depending downwards substantially parallel to the opening in said tubular casing, resilient means between said jaws and the tubular casing for urging the jaws to-
 85 wards the axis of the tubular casing for frictionally gripping casing tubes inserted through said tubular casing, radial depressible pegs extended through said tubular casing, resilient means be-
 90 tween said pegs and jaws, and means for depressing said pegs to various degrees for chang-
 95 ing the resilient action on the jaws, comprising a ring on said tubular casing and having a tapered upper portion, and means for raising said rings so that said tapered portion engages over the extended ends of said depressible pegs, com-
 100 prising said ring being threadedly engaged on said tubular casing, teeth on the periphery of said ring, a pinion meshing with said teeth, and means for turning said pinion.

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