A. J. SHARP & J. O. FOSTER.

SAFETY DRIVE FOR DRILLING MACHINE DRUMS.

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1,213,698.

Patented Jan. 23, 1917.

Fig. 1.

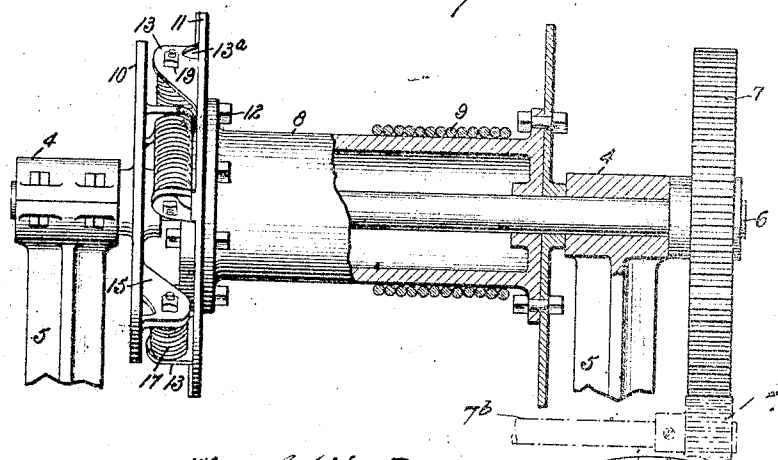
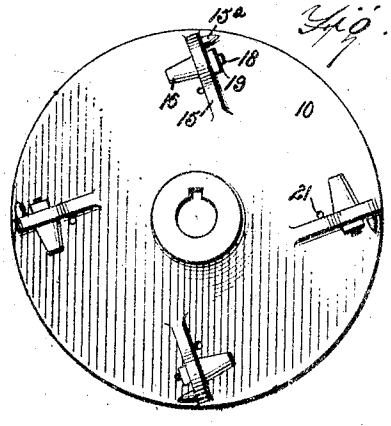


Fig. 2.



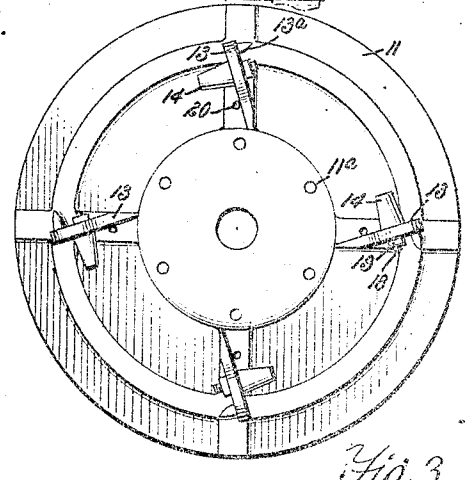
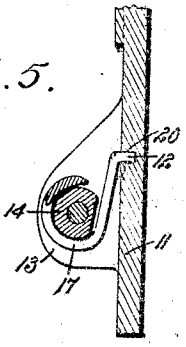
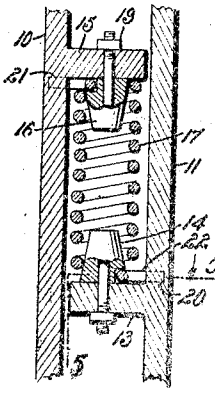


Fig. 3.

Fig. 4.

Fig. 5.





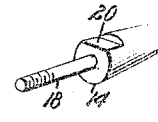


Fig. 6.

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SAFETY-DRIVE FOR DRILLING-MACHINE DRUMS.

1,213,698. Specification of Letters Patent. Patented Jan. 23, 1917.

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To all whom it may concern:

Be it known that we, ABIA J. SHARP and JOHN O. FOSTER, citizens of the United States, and residents of Harrisonville, in the county of Cass and State of Missouri, have invented a new and Improved Safety-Drive for Drilling-Machine Drums, of which the following is a full, clear, and exact description.

In operating drills of the type generally known as dropping drills, the rope or cable attached to the drill and winding on a drum is controlled by a speeding lever, whereby the cable is alternately slackened and tautened to raise and lower the drill. In the practical operation of such drills the drive devices for actuating the drum are subject to severe strain exerted on the cable and acting on the drive through the medium of the drum. In a patent granted to us December 2, 1913, No. 1,080,334, safety drive means is provided involving the use of compression springs interposed between the drive and the winding drum of the drilling machine to cushion the shocks and relieve the drive devices of strains. In the said patent, the disposition of the springs is such as to take care of compression, and an important object of the present invention is to provide an arrangement of springs positively fastened at the ends to the drive and driven elements thereby causing the springs to function for both compression and extension.

The invention also has for an object to provide a more direct application of the springs to the drum.

The invention will be particularly explained in the specific description following.

Figure 1 is a front elevation partly in section, showing a practical embodiment of our invention; Fig. 2 is a face view of the drive element; Fig. 3 is a similar view of the driven element; Fig. 4 is a detail transverse section through the drive element, driven element and interposed spring; Fig. 5 is a section on the line 5—5, Fig. 4; Fig. 6 is a perspective view of one of the guide studs or pins for the springs.

In constructing a practical embodiment of our invention in accordance with the illustrated example, suitable bearings 4 are provided on supporting standards 5, or the like. In the bearings is mounted to turn a winding shaft 6, which may be driven in any suitable manner. In the present example we have shown a gear wheel 7 on the shaft and indicated in dotted lines a pinion 7^a meshing therewith and mounted on a shaft 7^b to be driven from any convenient source of power (not shown).

The drum 8 in the present instance, is loose on the shaft 6 and receives the usual drilling rope or cable 9 which is given a suitable number of turns about the drum, and in practice, connects with the drill, running over guides and subject to the usual speeding lever (not shown), to alternately tighten and release the drill and then permit the same to drop. The power disk 10 is made fast on the winding shaft 6 by a key or the like, and said disk is positioned adjacent to one head 11 of the drum 8, said head 11 constituting the driven member. Interposed between the drive element 10 and the driven element 11 are the cushioning springs 17 which we secure positive at their ends, respectively, to the said drive element and driven element. Thus, on the outer face of the driven disk 11, lugs 13 are formed having pins or studs 14 secured thereto while on the opposed face of the drive element 10, similar lugs 15 are oppositely disposed and alternate with the lugs 13, said lugs 15 having pins or studs 16 disposed in the opposite direction to the pins 14. The respective lugs, 13, 15, overlap and constitute seats for the springs 17, the ends of which are received on the respective pins 14, 16.

Each stud or pin 14, 16 has a threaded shank 18 extending through holes in the lugs 13, 15 and provided with nuts 19 to secure the same in position. Each pin 14, 16 is notched at its base at a side thereof, as at 20, best seen in Fig. 6. In the driven disk 11 transverse recesses or holes 20 are formed adjacent to the lugs 13 and similar recesses or depressions 21 are formed to the opposed face of the drive disk 10 adjacent to the lugs 15. The springs 17, at the ends thereof, are given a bend to lie in the respective recesses 20, 21. Thus, the notched formation of the pins, 14, 16, and the engagement of the springs in the recesses of the drive and driven disks constitute one means for positively securing the ends of the springs to said disks, and an important result is obtained in that we are enabled to give the desired "end spring" to the cable for the successful operation of the well drill. The positive fastening of the springs at both

ends causes the same to act under both compression and extension and to take up the rebound of the drill instantaneously, thus enabling the drill to make a greater number of strokes per minute than is possible with springs simply abutting at their ends against the lugs of the respective disks. To strengthen the lugs, 13, 15, brace ribs 13ª, 15ª, are produced at the backs of the lugs at the junction of the same with the respective disks. Also, it will be observed from Figs. 2 and 3, that the lugs are disposed in planes at an angle to radial lines to dispose the springs in the proper positions about the disks. In the present instance the driven disk 11 is shown as secured to the drum flange by bolts 12 which pass through bolt holes 11ª in said disk.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. In a cushioned driving mechanism, a drive and a driven element, presenting opposed lateral faces formed with transverse recesses, springs interposed between said elements, and studs on the elements receiving the opposite ends of the springs, the said studs having lateral notches in which portions of each spring near the ends thereof are received, the extremities of each spring extending from the said notches into said recesses.

2. In a cushioned driving mechanism, a drive and a driven element, presenting opposite lateral faces formed with transverse recesses, springs interposed between said elements, studs having threaded shanks, the said elements having lugs through which the said shanks extend, and nuts rigidly securing the studs to said lugs, the studs furthermore having lateral notches at the bases thereof in which portions of each spring, near the ends thereof, are received, the extremities of each spring extending from the said notches into said recesses.

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