C. F. GREENE.

DUST COLLECTOR.

APPLICATION FILED MAY 25, 1917.

1,249,070.

Patented Dec. 4, 1917.

2 SHEETS—SHEET 1.

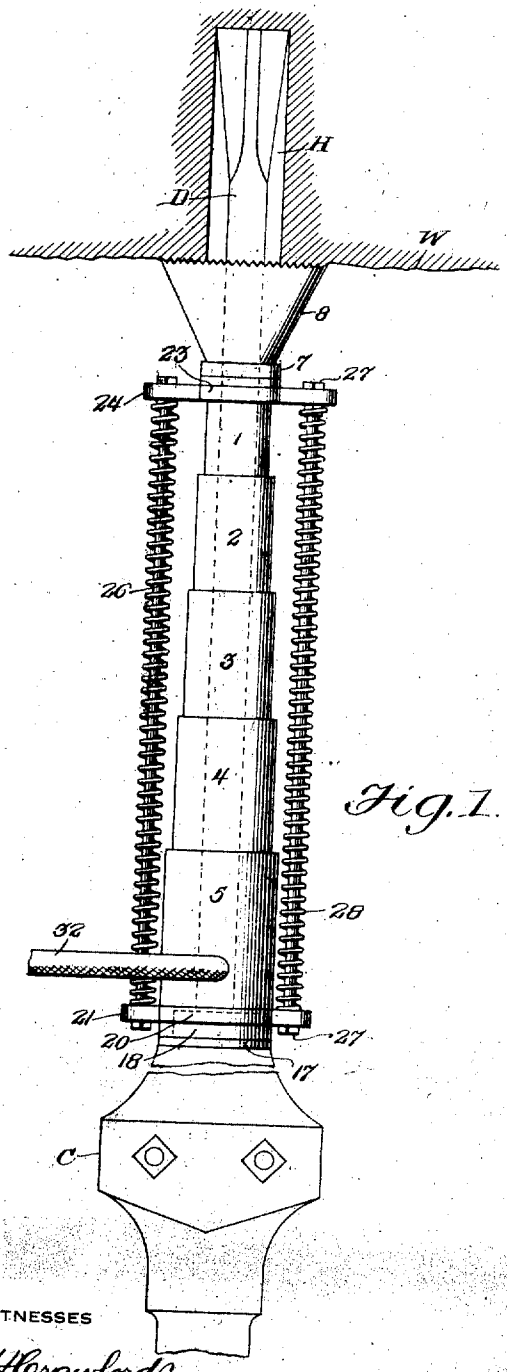


Fig. 1.

Fig. 6.

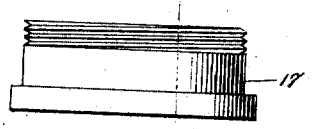
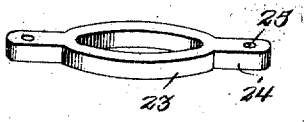


Fig. 5.



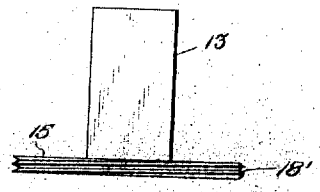


Fig. 7.

WITNESSES

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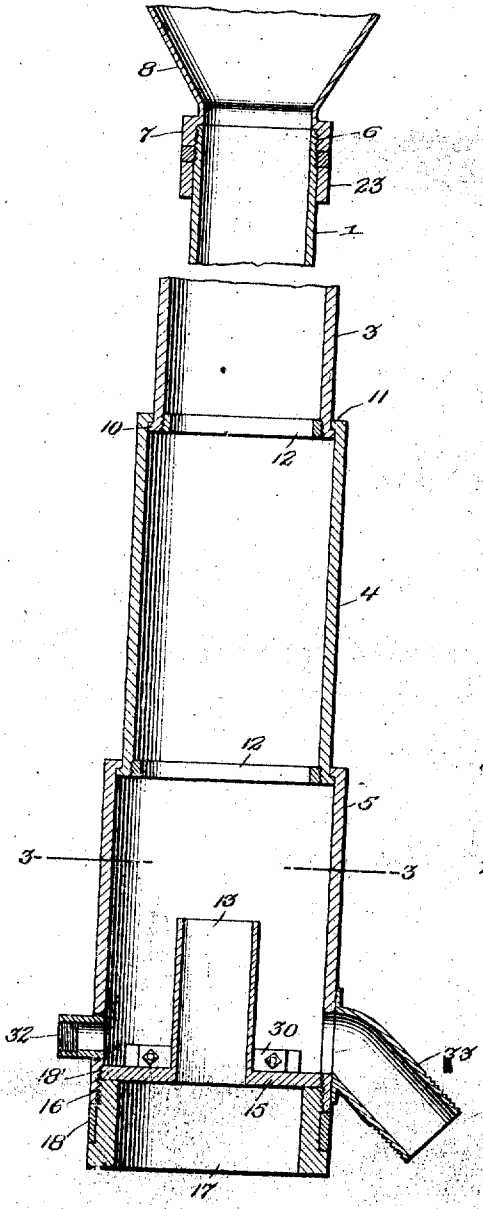


Fig. 2.

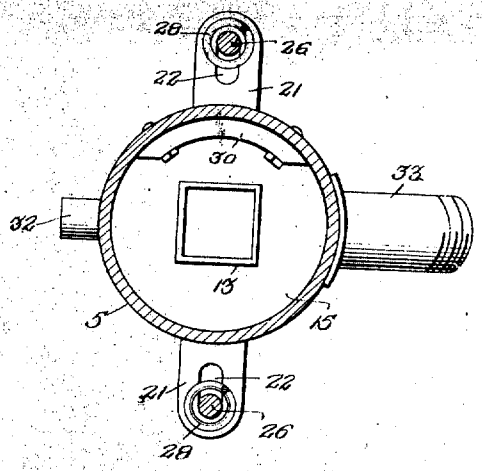


Fig. 3.

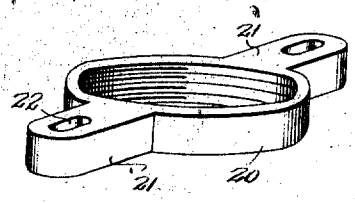


Fig. 4.

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UNITED STATES PATENT OFFICE.

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DUST-COLLECTOR.

1,249,070. Specification of Letters Patent. Patented Dec. 4, 1917.

Application filed May 25, 1917. Serial No. 171,018.

To all whom it may concern:

Be it known that I, CLAYTON F. GREENE, a citizen of the United States, residing at Lead City, in the county of Lawrence and State of South Dakota, have invented new and useful Improvements in Dust-Collectors, of which the following is a specification.

This invention relates to earth boring, and more especially to dust collectors for drills; and the object of the same is to produce a telescopic tubular guard to surround a drill, and more especially a rock drill or one for use in a mine, which will receive the particles of rock and dust that fall out of a hole being drilled upward and deliver the same to a suitable waste pipe, and which will also protect the operator from injury in case the drill should break or slip.

These and other objects are accomplished by constructing the device in the manner hereinafter more fully described and claimed, and as shown in the drawings wherein:—

Figure 1 is a side elevation of this device mounted on a drill ready for use.

Fig. 2 is a central vertical enlarged detail of the tubular guard itself, and Fig. 3 is a cross section on the line 3—3 of Fig. 2.

Fig. 4 is a perspective detail of one of the yokes, and Fig. 5 a perspective detail of the other.

Fig. 6 is a side elevation of the collar, and Fig. 7 is a side elevation of the drill guide.

In the drawings I have used the letter D to designate a drill, which is actuated by a chuck C into which its lower end is inserted, the same being driven by any suitable means not necessary to describe in this connection. In the present case the upper end or point of the drill is supposed to embed the rock whose lower face or wall is indicated at W, and as the drill is fed upward it produces a hole H out of which of course pieces of rock, coal, and other substance, and always a quantity of dust falls into the eyes of the operator standing beneath, and must of necessity be breathed by him; in fact, this is considered in metal mining as one of the prevailing causes of what is known as "miner's consumption," and it is one of the objects of the present invention to avoid contracting the same.

My improved dust collector consists principally of a tubular telescopic guard, shown herein as made up of five members numbered 1, 2, 3, 4 and 5 in Fig. 1, and progressively increasing in size downward. The smaller member 1 is externally threaded at its upper end as shown at 6, and onto said threads is screwed the bell mouth 7 of an upwardly flaring hopper 8, the upper or open end of the same being intended for contact with the face W of the wall of rock as seen in Fig. 3. The lower end of this member 1 and the lower end of each member, is flared as shown at 10 to produce an outstanding flange rotatably or swivelly engaged with an inturned flange 11 at the upper end of the member next beneath, and a strengthening ring or nut 12 may be screwed into the lower end of each member as seen. The lower end of the lower member 5 is internally threaded as at 16, and engaged with these threads are external threads at the upper end of a collar 17 around which may be swivelly mounted a ring 18. Either the ring or the collar is adapted for attachment in any suitable manner to the shell of the chuck C, the form of attachment being immaterial and therefore not described in detail. Resting on the shoulder at the upper end of the collar 17 is a disk 15 preferably threaded on its edge as at 18′ to engage the threads 16 within the lower member 5, and through the center of this disk is formed an upstanding tubular guide 13. This guide is shown square in Fig. 3, and a guide of that type will be employed when the drill-shank is square and the drill reciprocates. It is quite obvious, however, that a cylindrical guide could be substituted, and doubtless one will be used when the drill-shank is round and the drill is rotated by its motor within the chuck.

For distending the several members normally, there is secured upon the lower member 5 in any suitable way—perhaps by threads as shown in Fig. 4,—a yoke 20 having ears 21 provided with openings 22, and there is fastened on the upper member 1 a yoke 23 having similar ears 24 with openings 25. Through the openings 22 and 25 pass rods 26 headed at their upper and lower ends as at 27, and on each rod is a stout expansive coiled spring 28. The normal tendency of these springs is to spread the two yokes apart and therefore to separate the upper and lower members 1 and 5 of the telescopic guard, so that the flanges 10 and 11 at the meeting ends of all members are drawn outward to their limit as seen in Fig. 2. A stop

30 is preferably provided at an appropriate point in the lower member 5, so that the next member 4 above it can not be telescoped too far downward, or in other words, so that the flange 11 at the lower end of the member 4 cannot be pressed downward flat onto the disk 15 which supports the guide 13.

The numeral 32 designates an inlet pipe for the admission of water, and the numeral 33 designates an outlet for the escape of waste, by which term I mean water mixed with dirt, dust and particles of metal and stone. I have shown no hose or valve for admitting water, but its supply and control are obvious details not necessary to illustrate. Also the outlet or waste pipe 33 may be connected by hose with an appropriate receptacle, or the outlet hose or pipe led into a gutter or channel so that the waste will not run onto the feet of the operator.

In use, the parts are assembled as seen in Fig. 1, and the operator goes to work. Raising the point of the drill D, he enters it into the face W of the rock or wall overhead, and turns on the power.

The borings fall out the hole H into and through the hopper 8, into and through the upper member 1, and so on downward around the drill, and from time to time the operator admits water through the pipe 32, or he may permit it to flow in constantly to a limited extent. This water mixes with the borings, dirt, and dust, and the same are rinsed or washed out through the waste pipe 33 and carried away to a suitable point. Therefore the refuse does not fall into the face of the operator, and it is not even in the air which he is breathing. As the drill moves upward within the hole H, borne in that direction by pressure upward on the chuck C, the tubular guard telescopes as the slidable engagement of its several members with each other permits, and of course the springs 28 yield as the yokes approach each other. If now it should happen, as is often the case, that the drill breaks, the operator is not injured by the flying pieces or by the sudden lunge forward which results, because the guard contains the pieces of the drill as it did contain the whole drill and any forward or upward movement is cushioned by the expansive springs. The drill may be replaced by a longer one or a sharper one at any time, by dropping the entire device and applying a suitable tool to the drill D above the hopper 8; in other words, the guard does not have to be taken off of the chuck to permit the attachment and disconnection of the drills. The device is preferably entirely of metal, and I do not wish to be limited to the proportions and details further than is necessary.

What is claimed as new is:—

1. The herein described dust collector for drills, the same comprising a tubular guard made up of telescopic members adapted to surround the drill between its point and its driving mechanism, and means for holding said members normally distended.

2. The herein described dust collector for drills, the same comprising a tubular guard made up of a series of tubular members progressively increasing in size and each telescopically mounted on the next, means for preventing their complete disconnection with each other, yokes fixed around the endmost members and having outstanding perforated ears, rods passing through said perforations in pairs and headed at their extremities, and expansive springs coiled on the rods between the ears.

3. The herein described dust guard for drills, the same consisting of a tubular guard made up of pipe sections respectively increasing in size from one end of the guard to the other and telescopically mounted one on the next, means for preventing their complete separation, means for holding the sections normally distended, and a hopper on the smallest section for surrounding the drill-hole.

4. The herein described dust guard for drills, the same consisting of a tubular guard made up of pipe sections respectively increasing in size from one end of the guard to the other and telescopically mounted one on the next, at each meeting point between sections an outturned flange on the smaller and an inturned flange on the larger sections for preventing their complete separation, means for holding the sections normally distended and a hollow element carried by the outer end of the smallest section for inclosing the drill hole.

5. In a dust guard for drills, the combination with a series of telescopic tubular sections with the smallest uppermost, yielding means for holding them normally distended, means for preventing their complete separation, and a hopper carried by the smallest section; of a disk across the interior of the largest section, an upstanding drill-guide at the center of said disk, and a water inlet and waste outlet through the walls of this section, for the purpose set forth.

In testimony whereof I affix my signature.

CLAYTON F. GREENE.