

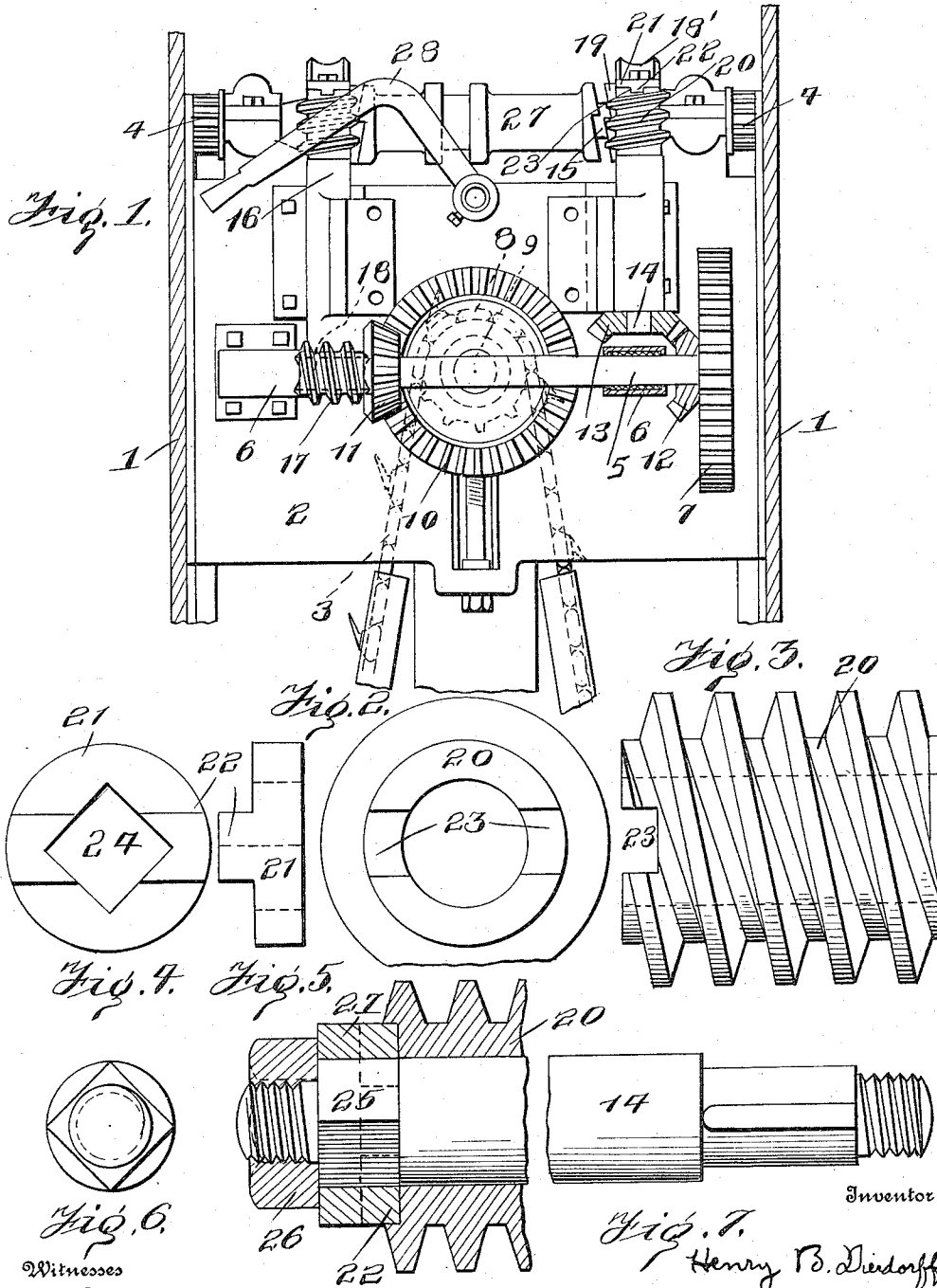
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SAFETY DEVICE FOR POWER TRANSMISSION.

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1,156,397.

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SAFETY DEVICE FOR POWER TRANSMISSION.

1,156,397.

Specification of Letters Patent.

Patented Oct. 12, 1915.

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To all whom it may concern:

Be it known that I, HENRY B. DIERDORFF, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Safety Devices for Power-Transmission, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to safety devices and has for its object to provide means simply constructed and convenient to use for automatically preventing the transmission of excessive power by a train of power transmitting devices and relieving the other more important parts of the mechanism of undue stress.

To this end the invention consists in the provision of an integral collar or washer-like part of frangible material having a non-circular aperture to fit a non-circular part of a shaft and having an interlocking engagement with a gear, wheel or the like, sleeved loosely upon the shaft, so that the three parts—shaft, washer and sleeve, are held against relative rotation normally, while the relative weakness of the washer insures its breakage and the consequent saving of the other parts when the mechanism is subjected to abnormal stresses.

While my invention may be applied in a great variety of ways, I have selected for the purpose of illustration, a mining machine of the kind described and shown in my Letters Patent of the United States No. 684,356 and will describe its manner of use with such a machine.

Figure 1 is a plan view of enough of the parts of a mining machine, similar to that described in the patent above mentioned, to make clear the manner of using my invention. Figs. 2 and 3 show the worm sleeve which is one of the elements of the safety device proper. Figs. 4 and 5 show the cast iron washer which is another element of the safety device. Fig. 6 is an end view of the shaft 14. Fig. 7 is a longitudinal cross section of the safety device with its various parts assembled.

1—1 indicate parts of the bed frame of a mining machine.

2 indicates the rear plate or platform of the moving carriage, this plate carrying the electric motor (not shown) and the power transmitting gearing connecting the motor

with the cutter-chain 3 and also with the pinions 4—4 which engage racks (not shown) carried by the bed frame for feeding the carriage backward and forward with respect to the bed frame.

The shaft 5, which is one of the elements of the power transmitting gearing above referred to, is mounted transverse of the carriage platform in the pillow-block bearings 6—6. The shaft rigidly carries at one end the spur gear wheel 7 which meshes with the motor pinion (not shown). The chain sprocket-wheel 8 is rigidly mounted below the plate 2 upon the vertical stub shaft 9, which is driven by means of the beveled gear wheel 10 and the beveled pinion 11, the latter carried rigidly by shaft 5.

The transverse shaft 5 also carries the gear wheel 12 which meshes with the beveled gear wheel 13 on the forward end of the horizontally arranged shaft 14. This shaft is adapted to transmit power to the carriage feed shaft 15 which has mounted upon its ends the pinions 4—4, and to transmit it in a direction to move the carriage backward so as to disengage the cutters from the coal. A similar shaft 16 arranged at the opposite side of the carriage platform receives power from the transverse shaft 5 through the worm 17 on the latter and the worm wheel 18 which it has mounted upon its forward end, and serves to rotate the shaft 15 in the opposite direction for feeding the carriage and cutter mechanism slowly forward against the face of the coal.

Motion is imparted to the shaft 15 from the short shafts 14 and 16 by similar mechanism in each case. In the case of the carriage retracting shaft 14, operative connection is made as follows: The worm-wheel 18' is mounted loosely upon the shaft 15 and engages the worm-sleeve 20 mounted loosely upon shaft 14. The worm sleeve 20 is made to revolve with the shaft 14 by means of the washer 21. This washer is provided with the lugs 22 which are received by the notches 23 in the outer end of the worm-sleeve 20, and this engagement of the lugs with the notches serves to cause the washer to rotate with the worm. The central aperture 24 of the washer is rectangular in shape and snugly fits over the square end 25 of the shaft 14. In this manner the washer is likewise caused to rotate with the shaft 14, and the worm sleeve and the shaft 14 are rigidly connected

with each other. The nut 26 holds the washer in position against the end of the sleeve 20.

The sleeve or hub 19 of the worm wheel 5 18' constitutes one element of a clutch of which the sleeve 27 splined to the shaft 15 is the other element. Each of the two elements is provided with spiral jaw teeth which engage each other to transmit motion 10 in one direction of rotation when the sleeve 27 is moved into operative position by means of the usual clutch controlling mechanism 28. When the sleeve 27 is shifted axially in the opposite direction, shaft 16 is similarly 15 connected positively to the shaft 15, and when the motor is rotated the carriage is slowly fed forward. Washers 21—21 are made of cast iron and will break if excessive stress is put upon them due to too rapid 20 feeding in the one case or to the cutters becoming caught or wedged in the coal in the case of the pull-back mechanism. These washers, when thus broken, can be readily replaced and the more expensive parts of 25 the transmission gear are, in this manner, saved from undue stress being put upon

them with the possible result of fracture or other harmful outcome.

What I claim is:

The combination in a power transmitting 30 mechanism, of a power transmitting shaft having a part circular in cross section and an adjacent part polygonal in cross section, a power transmitting sleeve journaled upon the circular shaft part and provided with 35 oppositely disposed notches in the end adjacent the polygonal shaft part, and an integral washer having a central aperture polygonal in cross section with its walls adapted to receive and closely engage the polygonal 40 shaft part and provided with oppositely disposed integral lugs adapted to engage the edges of the notches in the sleeve, the washer being formed of material which is relatively 45 frangible as compared with those of the shaft and sleeve.

In testimony whereof I affix my signature, in presence of two witnesses.

HENRY BEECHER DIERDORFF.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."