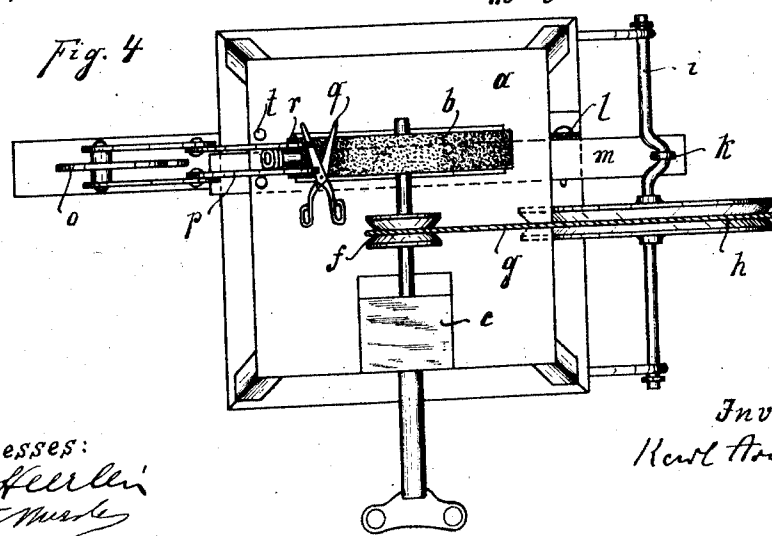
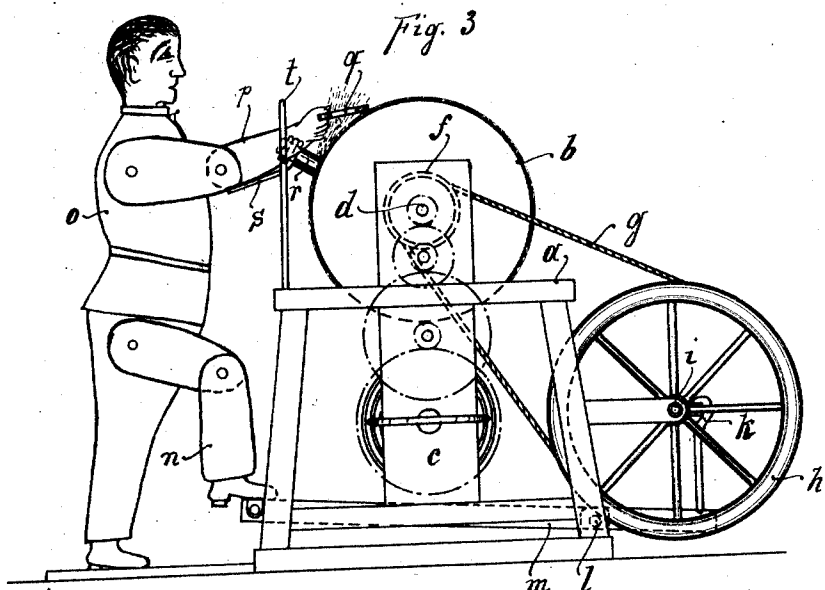
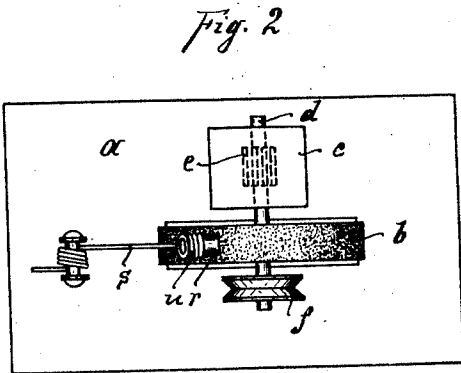
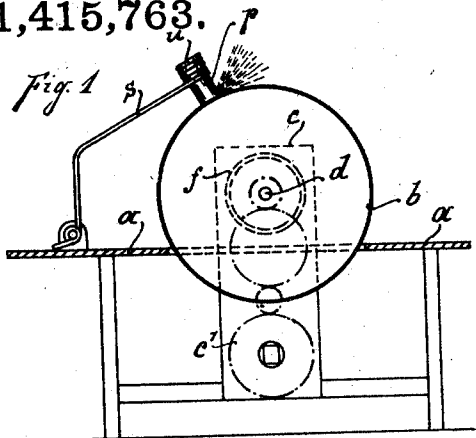


K. ARNOLD.
 DEVICE FOR PRODUCING SPARKS FOR TOYS.
 APPLICATION FILED JAN. 24, 1914.

Patented May 9, 1922.

1,415,763.



Witnesses:
K. Heerlin
For Arnold

Inventor:
Karl Arnold

UNITED STATES PATENT OFFICE.

KARL ARNOLD, OF NUREMBERG, GERMANY.

DEVICE FOR PRODUCING SPARKS FOR TOYS.

1,415,763.

Specification of Letters Patent.

Patented May 9, 1922.

Application filed January 24, 1914. Serial No. 814,240.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, KARL ARNOLD, a subject of the King of Bavaria, residing at Nuremberg, in the Kingdom of Bavaria, German Empire, have invented certain new and useful Improvements in a Device for Producing Sparks for Toys, of which the following is a specification.

With pyrophorous tinder-boxes devices are used for producing sparks for igniting a combustible substance which consist of a stone of ferro-cerium and of a file-shaped friction body.

This invention utilizes such a device for the continuous production of a flash of sparks composed of numerous small and comparatively cold jets to be utilized with toys for imitating different phenomenons. The device essentially consists of an emery disc adapted to rotate rapidly and rubbing against a body of ferro-cerium or similar pyrophorous metal whereby continuous flashes and bundles of sparks are produced. This bundle of sparks imitates the sparks produced by grinding machines, the sparks coming out the chimney of the engine, of steamers, the sparks produced by motor cars or the like.

In the accompanying drawings the invention is shown by way of example:—

Fig. 1 is an elevation.

Fig. 2 a plan view.

Fig. 3 illustrates the application of the device to a toy which represents a grinder with his grinding lathe.

Fig. 4 is a plan of Fig. 3.

The device which forms the object of the invention essentially consists of an emery disc *b* which is mounted on a spring barrel *c* by means of an axle *d*. On this axle *d* a toothed wheel is mounted driven by means of a transmission *c'* and designed to rapidly turn the axle and with it the emery disc *b*. The axle *d* could be driven through the intermediary of a rope pulley *f* from any sort of power.

A body *r* of ferro-cerium fixed at the end of a wire *s* fixed on the frame *a* of the device so that it acts like a blade spring bears against the periphery of the emery disc *b*. The free end of the wire is wound so as to form a sleeve *u* into which the body *r* of ferro-cerium is screwed. The emery disc

b is preferably made of a disc of wood or metal with a rim of emery paper or emery canvas.

The emery disc *b* being rapidly turned rubs slightly along the body of ferro-cerium whereby continuously numerous sparks are produced which together form a bundle of sparks but are not capable to ignite even such substances which are easily inflammable. The device therefore can be utilized for producing continuously a bundle of sparks to imitate the toys phenomenons which happen with engines or machines of any kind. Instead of the body of ferro-cerium any other pyrophorous body can be used. The toy represents a grinder with his grinding lathe shown in Figs. 3 and 4 consists of a lathe proper *a* in which the axle *d* of the grinding disc *b* is revolvably mounted. The axle *d* is connected by a convenient transmission gear with the spring barrel *c*. On the axle *d* there is further keyed a rope pulley *f* which by means of a rope *g* is connected with a rope pulley *h* keyed on the axle *i*. The axle *i* is connected with the foot lever *m* mounted on the pivot *l* by means of the crank rod *k*. The foot *n* of the figure *o* which represents the grinder is placed on the free end of the foot lever *m*. The grinding disc *b* consists of a rapidly revolvable emery disc. The figure *o* has arms *p* by means of which the tool *q* (knife or the like) is pressed against the periphery of the emery disc.

A stone *r* of ferro-cerium is fixed by means of a wire *s* to the movable arms *p* of the figure. The arms *p* being hingedly mounted on the figure *o* the stone of ferro-cerium is slightly pressed against the emery disc *b* by gravity. When said emery disc is being revolved the arms effect a vibrating movement and a bundle of igniting sparks is produced. The arms *p* are guided in a fork *t* and pivotally fixed to the figure so that they are supported by the body of ferro-cerium resting on the emery disc so that this body of ferro-cerium is continuously slightly pressed against the periphery of said disc. The vibrating movement of the body of ferro-cerium is transferred to the arms.

The bundle of sparks produced by the body of ferro-cerium comes out directly

from under the tool so that it looks as if the sparks were produced by the grinding of the tool.

The pyrophorous metal could further be arranged directly on the tool. The tool could further be pressed against one of the surfaces of the grinding disc.

I claim:—

A toy representing a knife grinder with grinding lathe comprising in combination with the grinding lathe, a figure of a man with movable arms, a tool held by said

arms, an emery disc forming the grinding disc, a body of pyrophorous metal such as ferro-cerium fixed to the arm of the figure so that it is pressed with slight pressure against said emery disc, the sparks coming out from under said tool. 15

In witness whereof I have hereunto set my hand in the presence of two witnesses. 20

KARL ARNOLD.

Witnesses:

A. HUELLIN,
HERBERT R. BOCK.