A. BUCHANAN.

DEVICE FOR BORING AND EXCAVATING COAL.

No 48,258. Patented June 20, 1865.

Fig. 1

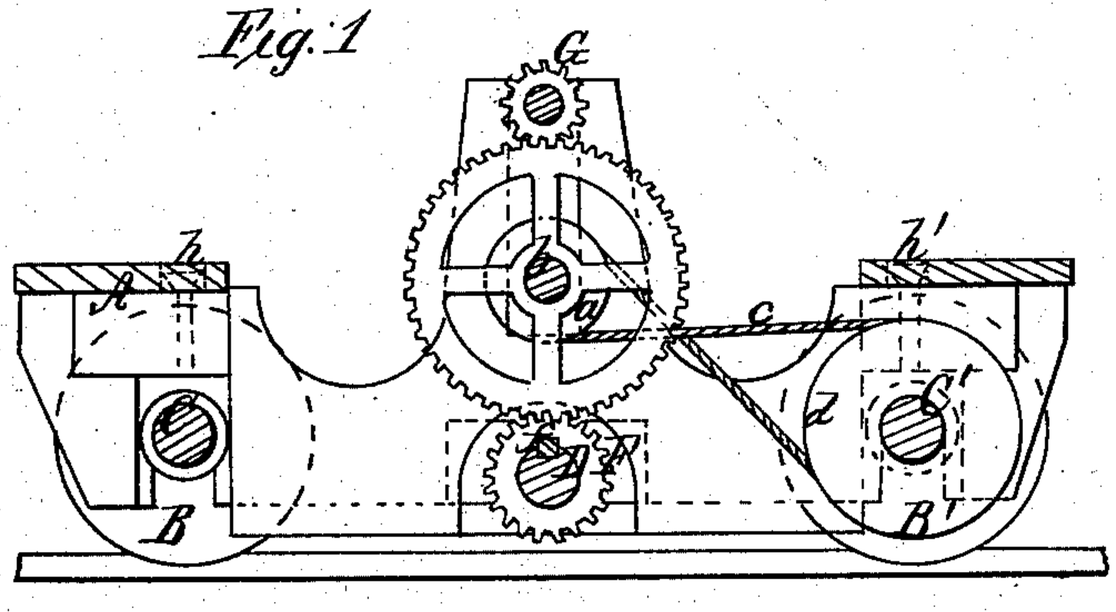
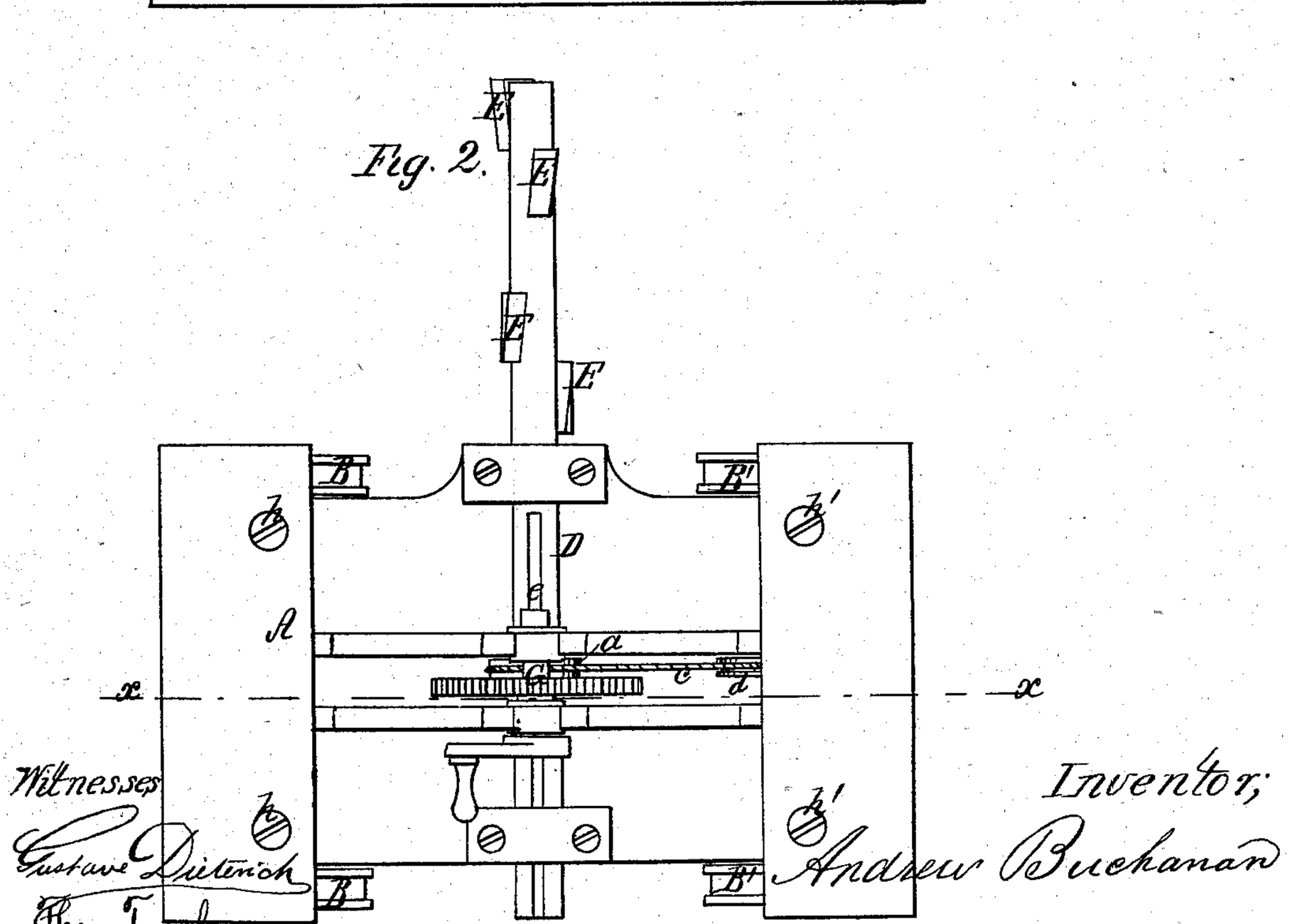


Fig. 2.



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IMPROVED DEVICE FOR BORING AND EXCAVATING COAL.

Specification forming part of Letters Patent No. **48,258**, dated June 20, 1865; antedated June 15, 1865.

To all whom it may concern:

Be it known that I, ANDREW BUCHANAN, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Machine for Excavating Coal, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal vertical section of this invention, the plane of section being indicated by the line *x x*, Fig. 2. Fig. 2 is a plan or top view of the same.

Similar letters of reference indicate like parts.

This invention consists in the employment or use of a revolving longitudinally-adjustable cutter-bar in combination with a truck, to which a feed-motion is imparted by the same power which is applied to impart motion to the cutter-bar in such a manner that by the action of the cutters inserted in said cutter-bar a narrow ditch of any desired length and of suitable depth can be cut in an embankment of coal, limestone, or other similar material, in a horizontal or inclined direction, and the labor of excavating coal or other material is considerably reduced. The cutters are arranged in sections, which are secured to the bar in spiral lines, so that the material to be excavated has a chance to clear itself, and the action of the cutters will not produce an injurious strain on the cutter-bar or other parts of the apparatus.

A represents a truck, which is supported by four (more or less) wheels, B B′, that are secured to axles C C. The wheels are provided with flanges, and placed in such a position in relation to each other that they will run on a railroad-track, such as generally laid down in coal or other mines to carry off the material which has been dug away. The lower part of the truck-frame forms the bearings for the bar D, which carries the cutters E. Motion is imparted to said cutter-bar by a pinion, F, which connects by suitable intermediate gear with the driving-shaft G, which receives motion by hand or other suitable power.

In practice it will be desirable to place on the platform of the truck A a small air, steam, or water engine to impart motion to the cutter-bar.

A pulley, *a*, mounted on the intermediate shaft, *b*, connects by a belt or chain, *c*, with a pulley, *d*, mounted on the axle C′ of the truck, and the speed of the intermediate shaft and the proportion of the pulleys *a d* is such that a slow forward motion is imparted to the truck, while the motion of the cutter-bar is as rapid as circumstances will permit. The connection between the shafts *b* and C′ can also be made by other means besides those represented in the drawings, and in practice it will be preferable to use chain-wheels instead of pulleys, and a chain instead of the belt, or a ratchet motion or any other suitable mechanism, whereby a positive forward motion is imparted to the truck.

The cutter-bar D extends transversely across the truck, and it is provided with a long groove or key-seat, *e*, and the pinion F is secured to it by a suitable key, *f*. By removing this key the cutter-bar can be adjusted in a longitudinal direction, according to the depth of the ditch to be cut. If the wheels of the truck move on a horizontal plane, the ditch produced by the action of the cutters will also be horizontal; but if it is desired to cut a ditch in an inclined direction, either the wheels next to the embankment or those on the opposite side of the truck are raised, according to the upward or downward inclination desired. To effect this purpose the boxes of the axles C C′ are made adjustable by means of screws *h h′*, or instead of these screws other means might be employed, though the screws are the simplest and most effective.

The cutters E are made in sections and secured in the cutter-bar in spiral rows, so that the coal or other material to be excavated has a chance to clear itself through the spaces between the cutters, and by placing said cutters in spiral rows the strain on the cutter-bar and other working parts of the apparatus is materially reduced.

The apparatus is of great convenience for excavating coal, limestone, chalk, soapstone, or other soft minerals, and by slightly chang-

ing the mechanism and the shape of the cutters it can also be used for hard rocks or minerals. It is operated with a comparatively small expenditure of power, and by its use a large amount of work can be performed without danger of the operator being crushed by the overhanging embankment.

I claim as new and desire to secure by Letters Patent—

1. The longitudinally-adjustable revolving cutter-bar D, in combination with the self-feeding truck A, constructed and operating substantially as set forth.

2. The use of sectional cutters E, in combination with the revolving cutter-bar D and truck A, constructed and operating substantially as and for the purpose described.

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