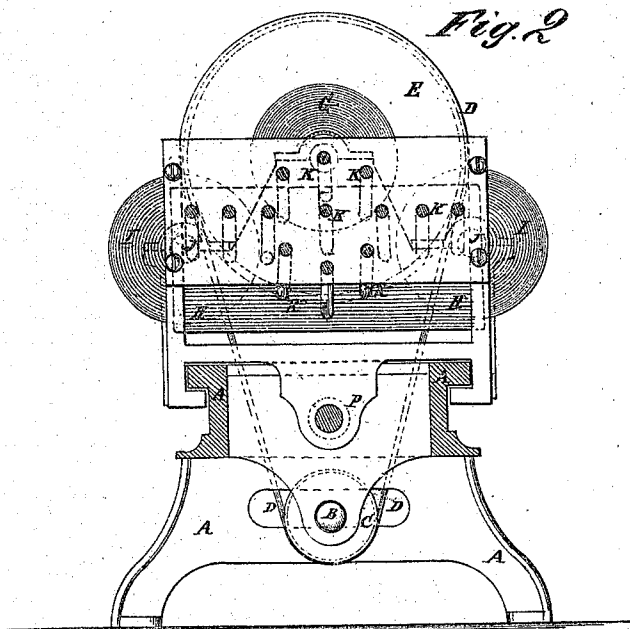
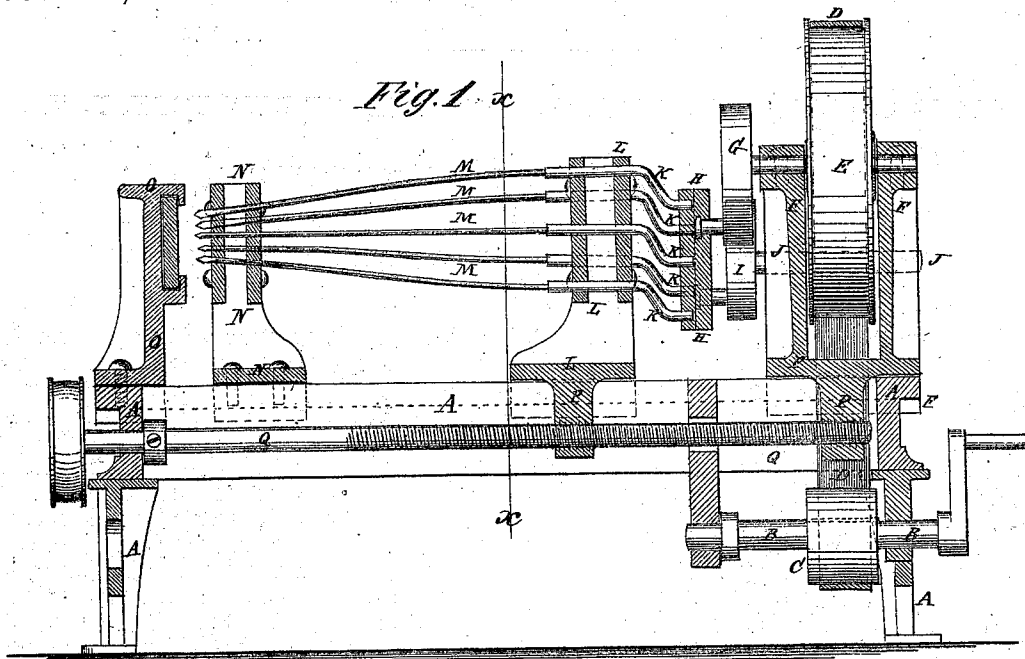


FRANK S. ALLEN & CHARLES F. RITCHEL.
 Improvement in Boring Machines.
 No. 121,074. Patented Nov. 21, 1871.



Witnesses:
 A. W. Almqvist
 Francis M. Aird.

Inventor:
 Frank S. Allen
 Charles F. Ritchel.
 PER *Munnell*
 Attorneys.

UNITED STATES PATENT OFFICE.

FRANK S. ALLEN AND CHARLES F. RITCHEL, OF NEW YORK, N. Y.

IMPROVEMENT IN BORING-MACHINES.

Specification forming part of Letters Patent No. 121,074, dated November 21, 1871.

To all whom it may concern:

Be it known that we, FRANK S. ALLEN and CHARLES F. RITCHEL, of the city, county, and State of New York, have invented certain Improvements in Boring-Machine; and we 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 drawing forming a part of this specification, in which—

Figure 1 is a detail longitudinal section of our improved machine. Fig. 2 is a detail vertical cross-section of the same taken through the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

Our invention has for its object to furnish an improved boring-machine, designed more especially for use in boring holes upon a flare and at different inclinations, and which shall be so constructed and arranged that all the holes, whatever or however different their inclination, may be bored at the same time and at one operation; and it consists in the construction and combination of various parts of the machine, as herein-after more fully described.

A represents the frame of the machine. B is the driving-shaft, to which the power is applied, and which revolves in brackets attached to the lower part of the frame A. To the shaft B is attached a long pulley or drum, C, around which passes the belt D, which also passes around the pulley E, the journals of which revolve in the brackets or frame F, which fits and slides upon ways in the frame A. To the forward journal of the pulley E is attached a crank-wheel, G, to the crank-pin of which is pivoted the plate H. The plate H is also pivoted near its ends to the crank-pins of two crank-wheels, I, attached to the ends of two short shafts, J, which revolve in bearings in the end parts of the frame F. By this construction the plate H is kept horizontal and in the same vertical plane during its movement. To the plate H are pivoted a series of oblique cranks, K, the forward parts of which work in holes in the supporting plate or frame L, which fits and slides upon the ways formed upon the frame A. The cranks K are equal in number to, and are arranged in the same relative position as, the holes to be bored. To the forward ends of the cranks

K are attached, or upon them are formed, the shanks of the bits of the boring-tools M, which are made elastic to adapt them for boring holes at different inclinations, and the forward parts of which pass through guide-holes in the plates N, the base-frame of which is securely attached to the frame A so as to be stationary. The guide-holes in the plate or plates N are so arranged as to give the bits the proper position to bore the inclined holes in the work, each at its proper inclination. O is the rest to receive and support the work while being bored, and which is also stationary, its base-frame being rigidly attached to the frame A. To the base of the guide-plate or frame L and of the pulley-frame F are securely attached nuts P, through which passes the screw Q, which is swiveled to the frame A, and to which power may be applied by a pulley and belt or by other well-known means. By this construction, by turning the swiveled screw Q in one direction the frame F and plate or frame L will be moved forward to feed the boring-tools M to their work, and by turning the said screw Q in the other direction the frame F, and frame or plate L will be moved back to withdraw the boring-tools M from the material bored. The plate or frame L and the frame F being both moved by the revolution of the same screw, are always held in the same relative position while being moved forward and backward.

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

1. The combination of the sliding frame F that carries the pulley E and crank-wheels G I, the sliding plate or frame L that supports the forward parts of the cranks K and their attached nuts P with the frame A, swiveled screw Q, stationary guide-plate N that guides the boring-tools, and stationary rest O that holds the work, substantially as herein shown and described, and for the purpose set forth.

2. The boring-tools M, made elastic, and arranged in the guide-frames or plates L N, so as to converge, as shown and described, for the purpose specified.

The above specification of our invention signed by us this 30th day of September, 1871.

FRANK S. ALLEN.

Witnesses: CHARLES F. RITCHEL.

JAMES T. GRAHAM,

T. B. MOSHER.

(173)