No. 708,881. Patented Sept. 9, 1902.

B. E. HERVEY.

BORING AND DRILLING MACHINE.

(Application filed Mar. 20, 1902.)

(No Model.)

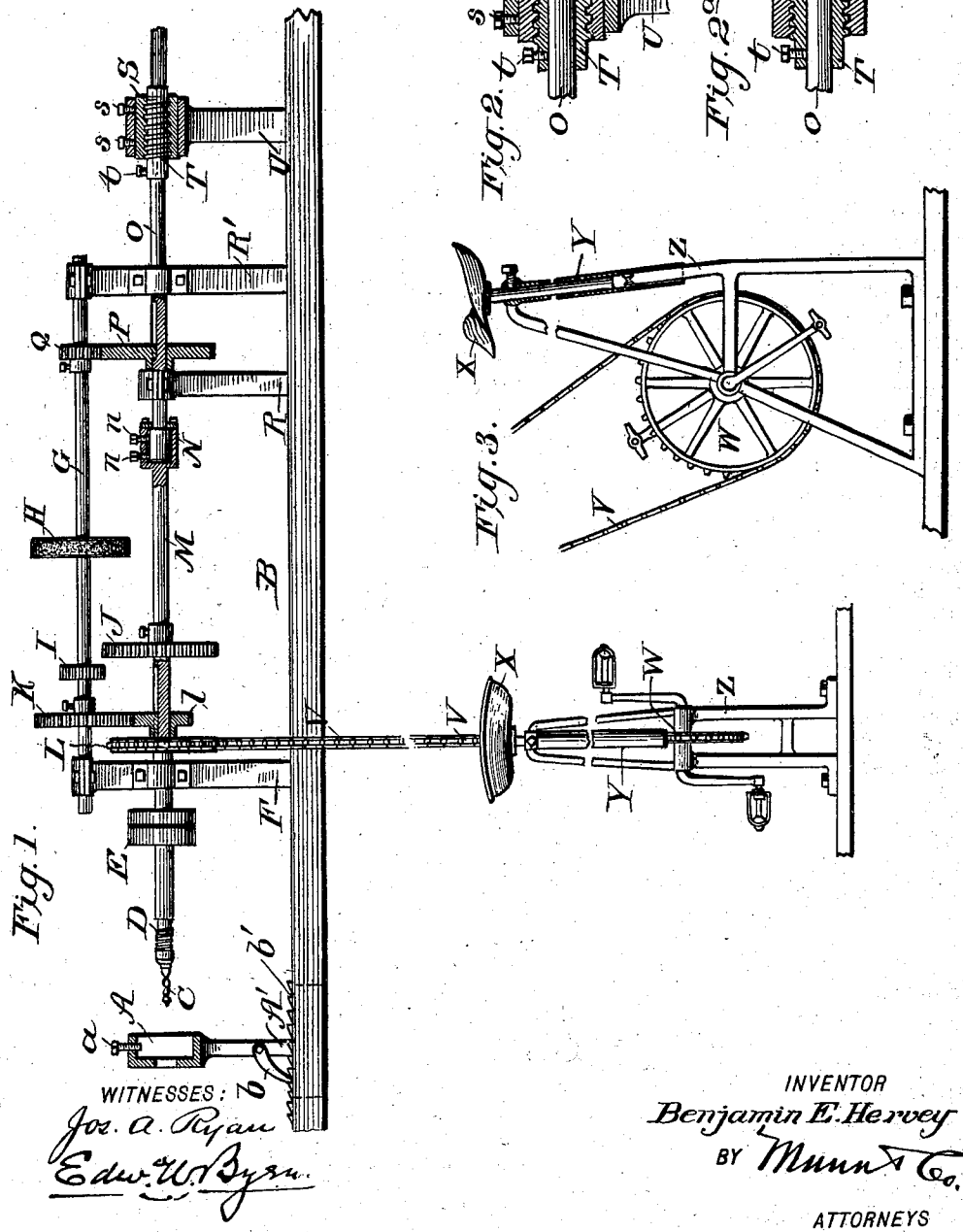


Fig. 1.

Fig. 2.

Fig. 2a.

Fig. 3.

WITNESSES:
Jos. A. Ryan
Edw. W. Byrn.

INVENTOR
Benjamin E. Hervey
BY Munn & Co.
ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

BENJAMIN E. HERVEY, OF RITZVILLE, WASHINGTON.

BORING AND DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 708,881, dated September 9, 1902.

Application filed March 20, 1902. Serial No. 99,037. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN E. HERVEY, of Ritzville, in the county of Adams and State of Washington, have invented a new and useful Improvement in Boring and Drilling Machines, of which the following is a specification.

My invention is in the nature of an improvement upon the boring and drilling machine for which Letters Patent No. 687,025 were granted me November 19, 1901; and it consists in certain features and details of construction whereby the scope of work and usefulness of that machine is greatly extended, as will be hereinafter more fully described with reference to the drawings, in which—

Figure 1 is a side elevation of my machine, partly in section. Fig. 2 shows enlarged detail views of the detachable screw-feed. Fig. 2^a is a similar view showing a different pitch of thread, which parts are to be interchangeable with those shown in Fig. 2 or any other of a series of different pitch. Fig. 3 is a side view of the operator's seat and treadle mechanism for driving the machine by foot-power.

In the drawings, B represents a suitable base or table surface, upon which are mounted the upright posts F, R′, R, and U. In suitable bearings in these posts are mounted the two alined horizontal shafts M and O, having a swivel-coupling at N. The posts F and R′ are extended above the others and also carry another horizontal shaft G, located above the shafts M and O and parallel with them. At the left-hand end the shaft M bears a chuck D for holding a boring-bit C, and also has a rigidly-attached pulley E, by which, through the medium of a belt, the shaft M may be driven by power machinery when required. Opposite the drill-bit there is mounted on a standard A′ a cup-shaped holder A, open at the side next the drill and having a set-screw *a* tapped through the top of the same to bind against a blank nut or other object held in the cup to be bored. The standard A′, with cup A, is adjustable to or from the drill in a longitudinal slot in the table and is held vertical and braced against the drilling strain by means of a drop-pawl *b*, jointed to the standard and engaging adjustably with ratchet-teeth *b′* on the table.

On the shaft M there is mounted a sprocket-wheel L, having beside it a rigidly-attached pinion *l*, which parts are together adjustable longitudinally on the shaft M, but revolve with it by means of a groove in the shaft and a key in the hub of the wheels. This sprocket-wheel is turned by a chain belt V from a treadle mechanism below, as hereinafter described, and the small gear or pinion *l* meshes with a larger gear-wheel K on the shaft G above, which larger gear is connected rigidly by a set-screw to said shaft. The motion transmitted from pinion *l* to the gear K is relatively slow. There is, however, another pair of gears I and J for connecting shaft M to G, and as gear J is much larger than I the shaft G is through these gears driven much faster. The purpose of this is to permit an emery-wheel H on shaft G to be run at a high speed. The gear J is fastened to shaft M by a set-screw, and for boring this set-screw is loosened and gear J shifted sidewise out of mesh with the gear I while the pinion *l* and gear K are engaged. When, however, only the emery-wheel is in use, the pinion *l* and gear K are disengaged and the gears I and J are connected.

The rotary motion for turning the drill C is supplied by the sprocket-wheel L or pulley E, and to feed the drill forward the shaft O is fed forward and through the swivel-coupling N advances the drill at a regulated rate. The means for doing this are as follows: A small gear Q is rigidly attached to the shaft G by means of a set-screw and is made to mesh with the larger gear P, which is adjustably mounted on the shaft O by means of a groove and a feather, so that while P turns rigidly with the shaft O the said shaft may pass endwise through said gear. By means of the set-screw, however, the small gear Q may be moved along shaft G, so as to be connected to or disconnected from the gear P, as may be desired. The shaft O has attached to it a detachable sleeve T, fastened to it by a set-screw *t*, and this sleeve has upon its exterior screw-threads of a definite pitch, which mesh with the corresponding screw-threads on the interior of a detachable bushing S, held by set-screws *s s* in the bearing of the standard U. When, therefore, the shaft O is turned, its rigidly-attached screw-sleeve T

feeds forward in the screw-threaded bushing S and advances the drill, the shaft O sliding through the gear-wheel P by reason of its feather-and-groove connection therewith. The object in making the screw-threaded sleeve T and screw-threaded bushing S detachable is to permit them to be made in sets of a different pitch of threads, as seen in Fig. 2ª, so that by removing one screw-sleeve and bushing and substituting another the rate of forward feed of the drill may be changed, as desired.

To lock the two alined shafts M and O rigidly together, set-screws *n n* are tapped in the side of the swivel-coupling N. This permits the shafts M and O to be turned by the gears P and Q and the shafts advanced by the screw-feed S and T, so as to bore direct.

By disengaging gears *l* and K, engaging J and I, disengaging P and Q, and locking shafts M and O together by the coupling N a slow boring rotation and advance of shafts M and O may be had, and at the same time a high-speed revolution of shaft G obtained for rotating any high-speed tool, such as an emery or buffer wheel, a saw, or the like.

To drive my boring-machine by treadle-power, the chain belt V connects with a sprocket-wheel W, having pedals, as in my former patent. The seat X, however, is made vertically adjustable, like a bicycle-seat, by a post extending down a hollow pipe Y, and the frame Z of the seat is bolted to the floor.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a drilling and boring machine, the combination of the two alined shafts M and O having a swiveling coupling N and means for locking this coupling so that the two shafts turn together as one, an endwise screw-feed for the shafts, a counter-shaft G, gears for transmitting power from shaft M to shaft G, separable gears for transmitting power from shaft G to shaft O, one of said latter gears having a feather-and-groove connection with shaft O, substantially as described.

2. In a drilling and boring machine, the combination of the two alined shafts M and O having a swiveling coupling and means for locking the same, a parallel counter-shaft G, two pairs of separable gears for imparting motion from shaft M to shaft G, said pairs of gears being arranged for different speed and having shifting devices for coupling one pair and uncoupling the other pair, and a third set of separable gears for imparting motion from shaft G to O, one of said gears being connected to the shaft by a feather and groove, and a screw-feed for said latter shaft substantially as described.

3. In a boring and drilling machine, the combination with the boring-shaft; of a cup-shaped support for holding the article to be bored, said cup-shaped support having its open side next the drill and having a set-screw tapped through the sides of the cup to hold the article to be acted upon substantially as described.

BENJAMIN E. HERVEY.

Witnesses:
H. B. EATON,
M. W. STARR.