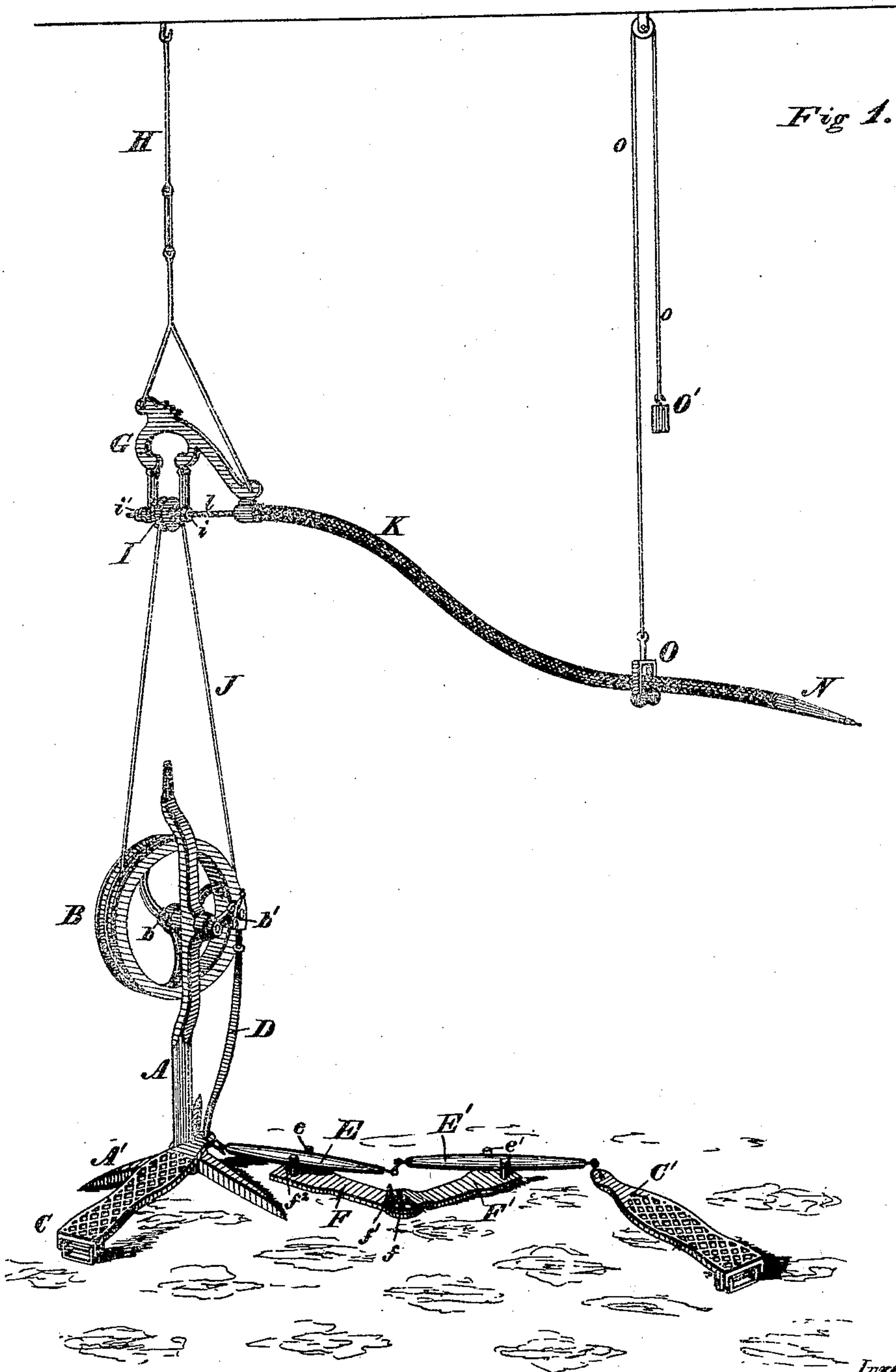


N. STOW.
Dental Engines.

No. 153,392.

Patented July 21, 1874.



Witnesses.

Harry King
Ed Davidson

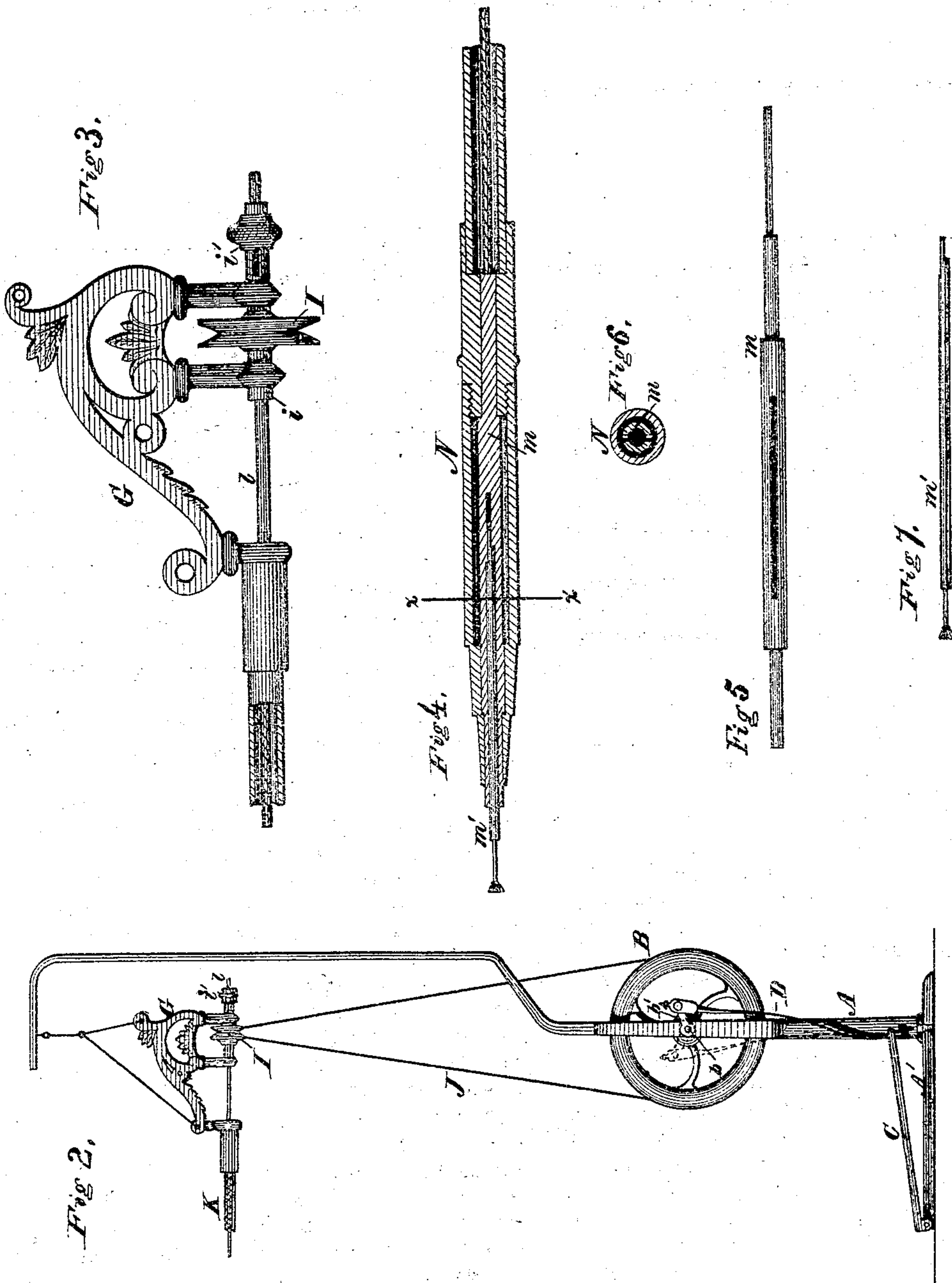
Inventor.

Nelson Stow
by his Atty
Wm. Baldwin

N. STOW.
Dental Engines.

No. 153,392.

Patented July 21, 1874.



WITNESSES

Harry King
Chas. Davidson

Bij

Nelson Stow

INVENTOR

Wm. Baldwin, Jr. Attorney

UNITED STATES PATENT OFFICE.

NELSON STOW, OF BINGHAMTON, NEW YORK, ASSIGNOR TO SAMUEL S. WHITE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN DENTAL ENGINES.

Specification forming part of Letters Patent No. 153,392, dated July 21, 1874; application filed June 3, 1874.

CASE A.

To all whom it may concern:

Be it known that I, NELSON STOW, of Binghamton, in the county of Broome and State of New York, have invented certain new and useful Improvements in Dental Engines, of which the following is a specification:

The accompanying drawings show all my improvements as embodied in the best way now known to me; obviously, however, some of these improvements may be used without the others, and in machines differing in construction and adaptation from the one therein represented.

Figure 1 represents a view in perspective of the entire apparatus organized as a dental drill, with the pulley-bracket suspended from the ceiling; Fig. 2, a view of the engine with the pulley-bracket suspended from a crane-post or overhanging arm thereon. Fig. 3 shows a side elevation of the swinging pulley-bracket and flexible connections, partly in section. Fig. 4 represents an axial section, on an enlarged scale, through the hand-piece and its flexible connections with the engine. Fig. 5 is a detail view of the tool-holder; Fig. 6, a transverse section therethrough, on the line *x* of Fig. 4. Fig. 7 is a view of a burr-drill adapted to the hand-piece of my engine.

The first branch of my invention relates to the connection between the driving-power and the driven mechanism. Its objects are to obtain freedom of movement of such mechanism in a simple and effective manner, without deranging its connection, while dispensing with the vibrating arms, pulleys, and long belts heretofore employed; to which ends my improvement consists, first, in combining the driving-power directly with the driven mechanism by an endless belt passing over a pulley suspended flexibly, and capable of being turned in all directions; second, in mounting the driven mechanism in a bracket suspended by an elastic connection, so as always to maintain the tension on the driving-belt, while leaving the bracket free to turn in its supports. Third, my improvement further consists in suspending a pulley-bracket directly from the top of the post or arm of the base or stand in

such manner that it may swing freely thereon in a horizontal plane. Fourth, my improvement further consists in combining a pulley, (driven directly from the driving-wheel and mounted in a suspended swinging bracket-frame turning freely in its supports in a horizontal plane,) a flexible sheath connecting the bracket-frame and hand-piece, and a wire coil connecting the pulley and tool-holder, whereby the tool may be freely turned in all directions. The next part of my invention relates to the flexible connection for driving the drill, and constitutes an improvement on the invention shown in Letters Patent No. 130,253, granted to me August 6, 1872, for an improvement in flexible shafts. In that patent a wire-coil shaft is shown as rotating within a non-rotating flexible sheath. In such an apparatus it is desirable to be able to remove the rotating wire coil to oil the various parts of the mechanism. To this end my improvement consists, fifth, in passing the wire coil through a clamp-mandrel, on which the belt-pulley is mounted, a nut on the mandrel serving to clamp the wire coil as required, whereby it may readily be inserted in and securely held by the clamp, or it may readily be released therefrom. The next part of my invention relates to the hand-piece. Its object is to hold the tool firmly therein, while allowing it readily to be removed or inserted; to which end my improvement consists, sixth, in slotting the tool-holder longitudinally near its middle, to give it a slight spring, the end of the tool being flattened, so that when inserted in the tubular socket its flattened end will act as a wedge to force apart the slotted sides of the holder, thus securely holding the tool. Seventh, my improvements further consist in combining with the flexible shaft a sliding clevis, so suspended and counterbalanced as to slide freely on the shaft, so as to counterpoise the weight of the hand-piece and shaft, to prevent them from dropping into an inconvenient position when released by the dentist, or to hold them in any desired position.

An upright arm, post, or frame, A, is firmly secured upon a suitable base, stand, or tripod,

A'. A driving-wheel, B, turns with a shaft, *b*, mounted in suitable bearings in the frame, and is rotated by a crank and pitman. A foot-treadle, C, pivoted at one end on one foot of the tripod, has a spring-pitman, D, firmly secured to its other end.

The spring-pitman and treadle shown in the drawings form the subject-matter of another application, and need not be more particularly described here, as the ordinary pitman and treadle may be employed.

In order to obtain freedom of movement for the driven mechanism, I mount said mechanism in a bracket-frame, G, suspended by a cord, H, from a crane-post on the stand A', (see Fig. 2,) or from the ceiling, walls, or gas-fixtures of the room, (see Fig. 1,) and drive it by a belt, J, running directly from the driving-wheel B to the driven pulley I, by which means the bracket-frame can be swung round into any desired position without interfering with the working of the driving-belt. In order to permit of a lateral movement of the bracket-frame, and to compensate the shortening of the belt or the radial movement of the bracket-frame around the driving-shaft, I make the suspending-cord H of rubber, coiled wire, or other yielding material which will admit of the necessary play. The driven pulley I is fixed on a tubular mandrel, *i*, turning and moving freely endwise in bearings in the bracket-frame G. A flexible tube or sheath, K, such as shown in my patent of August 6, 1872, hereinbefore mentioned, connects the bracket-frame with a hand-piece, N. A wire coil, *l*, also like that shown in my patent aforesaid, passes through the tubular mandrel *i*, the outer projecting end of which is split and provided with a screw-nut, *i'*, thus forming a clamp to grasp the wire coil firmly, while allowing it readily to be removed or replaced. The wire coil unites with a tool-holder, *m*, turning in bearings in the hand-piece N. The front portion of this tool-holder is made tubular, and it is slotted longitudinally near its center. The tool *m'* is made with a round shank, flattened at its rear end, and having a projecting shoulder on each side of this flattened central portion, (see Fig. 4,) so that when the tool is inserted in the holder its flattened part enters the slot and wedges itself therein, being tightly held by the springing of the walls of the slotted portion of the holder. The shoulders regulate the depth to which the tool is inserted in the holder. It can be removed simply by pulling it out of the holder, and inserted simply by pushing it in. The advantages of thus dispensing with fastenings, screws, locking-

pins, or springs separate from the holder are obvious. A clevis, O, capable of sliding freely on the flexible sheath or hand-piece, is suspended by a cord, *o*, passing over a pulley, and provided with a counterbalance, O', so that the hand-piece, instead of falling into an inconvenient position when released by the operator, may be retained in or moved to any desired position where it can most conveniently be reached.

I claim as of my own invention—

1. The combination, substantially as set forth, of a bracket-frame, in which the driven mechanism is mounted, suspended by cords or equivalent flexible connection, the driving-wheel, and the belt passing directly from the driving-wheel to the driven pulley on the bracket-frame.

2. The combination, substantially as set forth, of the driving-wheel, the bracket-frame, the driving-belt passing directly from the driving-wheel to the driven pulley on the frame, and an elastic suspending-cord, H, which permits the lateral movement of the bracket-frame.

3. The combination of the base, its rigid upright arm, the pulley-bracket suspended to swing freely thereon in a horizontal plane, the pulley, and the flexible shaft, all these members being constructed and operating in combination, substantially as hereinbefore set forth.

4. The combination, substantially as set forth, of the suspended bracket-frame, the pulley therein driven directly from the driving-wheel, the hand-piece, the flexible sheath connecting the bracket-frame and hand-piece, and the wire-coil connection between the driven pulley and the tool-holder.

5. The combination, substantially as set forth, of the suspended swinging bracket-frame, the tubular, rotating, endwise-moving mandrel, the wire coil, and the clamp on the mandrel.

6. The combination, substantially as set forth, of the tubular-ended, slotted tool-holder, having elastic walls, and the flattened tool-shank.

7. The combination, substantially as set forth, of the flexible sheath, the hand-piece, and the counterbalancing suspended traversing clevis.

In testimony whereof I have hereunto subscribed my name.

NELSON STOW.

Witnesses:

ROBT. E. PATTISON,
JAMES BATEMAN, Jr.