

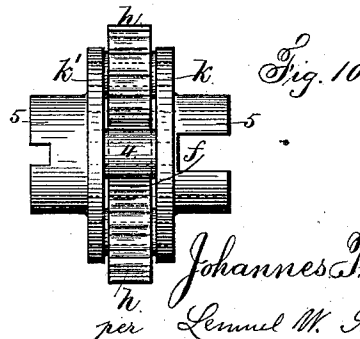
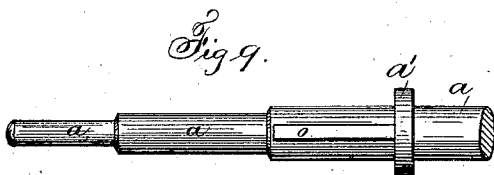
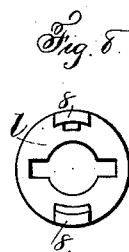
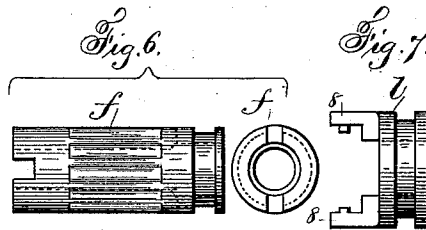
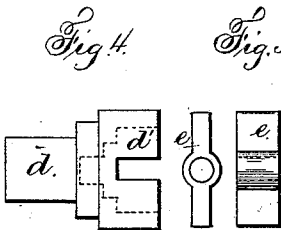
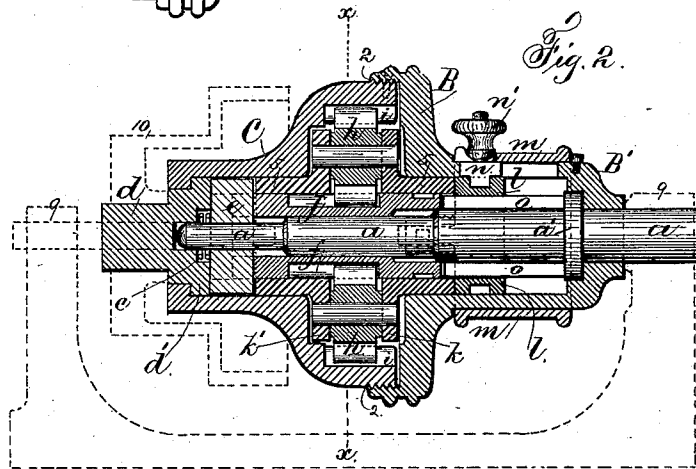
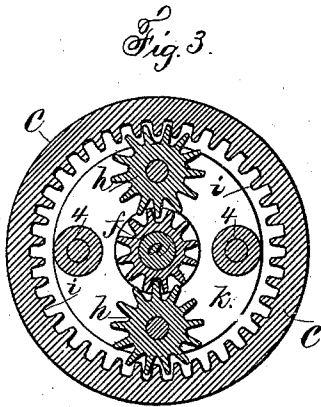
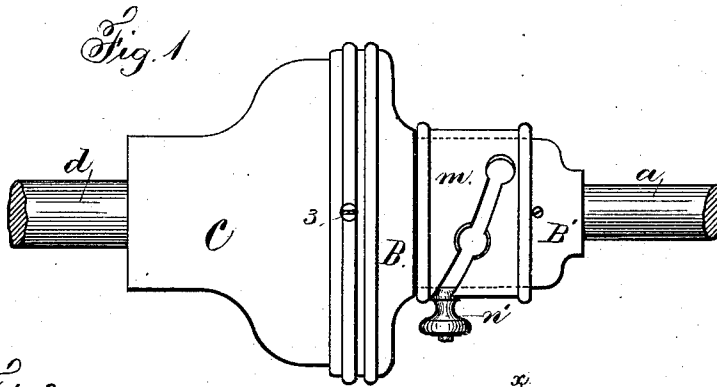
(No Model.)

J. T. PEDERSEN.

DEVICE FOR TRANSMITTING MOTION.

No. 311,255.

Patented Jan. 27, 1885.



Witnesses
Harold Serrell
Chas. H. Smith

Inventor
Johannes T. Pedersen
per Lemuel W. Serrell atty

UNITED STATES PATENT OFFICE.

JOHANNES TH. PEDERSEN, OF BROOKLYN, NEW YORK.

DEVICE FOR TRANSMITTING MOTION.

SPECIFICATION forming part of Letters Patent No. 311,255, dated January 27, 1885.

Application filed August 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHANNES THEODOR PEDERSEN, of Green Point, Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Devices, for Transmitting Motion, of which the following is a specification.

This device is primarily for transmitting motion to a drill, but it is available for other purposes where there is a shaft that is revolved by power, and in line with it is a second shaft. My mechanism intervenes between the motor-shaft and the driven shaft, and is adjustable so that the driven shaft may go at a slow rate of speed to the motor-shaft; or it may be rotated at the same speed or at an accelerated speed, so that, when my improvement is applied to a brace, the boring or other tool can be rotated slowly and with considerable power; or it can be rotated at the same speed as the brace or at an accelerated speed, thus allowing for driving the drill at the proper speed, according to the work that it has to do.

In the drawings, Figure 1 is an elevation of the apparatus. Fig. 2 is a longitudinal section of the same. Fig. 3 is a cross-section at the line *x x*. Figs. 4, 5, 6, 7, 8, 9, and 10 are views of the separate parts.

The motor-shaft *a* is to be attached at its outer end to the brace or other device by which it is to be rotated.

B and C are the two parts of the shell or case containing the mechanism. These are screwed together at 2, and provided with a tap-screw, 3, passing in between the two parts, to prevent them unscrewing when in use. The part B of the case forms the bearing within which the motor-shaft *a* is supported and rotates, and the part C receives within it the shaft or tool-holder *d* that is to be rotated. This shaft or holder *d* is in line with the shaft *a*, but separated therefrom, and within the shell C there is the hub or stock *d'*, formed with or permanently attached to the shaft *d*. This hub is a hollow cylinder and notched along the sides of such cylinder. The shaft *a* has a collar, *a'*, within the shell B, to prevent end motion, and around this shaft there is a loose pinion, *f*, in the form of a sleeve, to which an endwise motion can be given, and the pinion is of sufficient length to remain in gear with the intermediate wheels, *h*, when such pinion-sleeve is moved in either direction. The wheels *h* are supported by arbors passing

through the disks *k k'*, which disks are connected together firmly by the columns 4 4, and there are hubs 5 5, extending from these disks each way into the hollow portions of the shells B C, respectively, so that such disks can revolve within the shells and move around as a "sun and planet" motion, the teeth of the wheels *h* gearing into the teeth of the female wheel *i*, around on the inside of the case C.

Upon the shaft *a* there is a key or feather, *o*, and a key seat or slot is provided inside the pinion *f*. This pinion can be moved forwardly, so that it is free from the key *o*, and in this position the pinion *f* turns independently of the shaft *a*. If the pinion is slipped endwise until its slot passes over the key, then the shaft and pinion turn together. To give this end motion to the pinion *f*, I make use of the sliding clutch *l*, which has a groove around it, into which is received the block *n*, that slides in a longitudinal mortise in the smaller cylindrical portion B' of the case B, and around this part of the case B is a band, *m*, that is provided with a diagonal slot having enlargements at the ends and at the middle, and upon the block *n* is a screw receiving the nut *n'*, that has a conical or rounding end. When this nut *n'* is slackened, the band *m* can be partially rotated to move the block *n* and clutch *l* endwise within the case B', and by screwing down the nut *n'* the block *n* and clutch *l* will be held in one of the three positions—either drawn back toward the end of B', or forced in toward the middle of B', or at an intermediate position. Upon the clutch *l* are arms 8, that receive between them the flanged end of the sleeve of the pinion *f*, and the cylindrical portion or hub 5 of the disk *k* is slotted longitudinally, so that these arms can pass thereunto.

The parts are made so that when the clutch *l* is drawn back fully, the sleeve and pinion *f* are moved endwise until the slotted pinion-sleeve passes over and connects with the key *o* on the shaft *a*. If now this shaft *a* is rotated, and the shells B C are held stationary in the hand, the pinion *f* is revolved, and this acts to revolve the gears *h*, and they roll around within the female gear *i*, and give a slow but powerful rotation to the disks *k k'* and their hubs 5. If now the clutch *l* is moved to the intermediate position, the arms 8 slide into the notched hub 5, and the parts are all locked together and must revolve together, because at this time the pinion *f* has not been moved

far enough to clear it from the key *o*, hence in this position the tool will be rotated at the same speed as the brace, and the shells will revolve at the same time. If now the clutch *l* is moved still farther inwardly, or toward the disks *k k'*, the pinion *f* is disconnected from the key *o* on the shaft *a* by being moved endwise beyond the key, and the pinion is free to revolve independently of the shaft *a*; but this shaft *a* and the disks *k* are permanently connected by the clutch *l*, key *o*, and arms 8. If now the shaft *a* is rotated, the disks *k k'* will be carried around and a rapid motion given to the central pinion, *f*, in consequence of the gears *h* being carried around the said pinion and receiving motion from the gear *i* within the case C, which case and gear are to be held stationary by hand when the rapid movement is made use of. The shaft *d* and its cylindrical hub *d'* within the shell C are kept in their forward position by the conical end of the shaft *a* bearing against a hardened step within the hub *d'*, so that pressure upon the drill is received against this conical end of *a*. The end portion of the shaft *a* is cylindrical and of a reduced size, and around it is the eye of the cross-key *e*, which is within the longitudinal slots in the hub *d'*, and between such hub and the cross-key there is a helical spring, *c*, that presses the cross-key backwardly. In the forward end of the pinion-sleeve *f* there is a cross notch or slot adapted to receive about half of the key, and in the forward end of the hub 5 of the disk *k* there is a similar cross-slot. It is now to be understood that when the pinion *f* is moved endwise to its extreme forward position the key *e* is entirely within the slotted hub *d'*, and the end of the pinion-sleeve also being within the slotted hub *d'*, and also holding in its slot a portion of such cross-key *e*, the said key becomes a permanent connection between the pinion-sleeve and the cylindrical hub *d'*, so that said hub *d'* and its shaft *d*, and the tool or other device connected with such shaft, receive their rotation from the pinion *f* and its sleeve, and this motion is rapid, as before described, in consequence of the motor-shaft being connected to the hub 5 and the disks, and revolving them and the wheels *h* around the central pinion, *i*. If now the clutch *l* is drawn back to its intermediate position, the cross-key remains partially in the slotted hub *d'*. It also remains in the slot of the pinion-sleeve, and it is also moved back into the slot in the hub 5 upon the disk *k'*; hence said key locks all these parts, and they turn together, as before described. If the sleeve and pinion are still farther drawn back into the third position aforesaid, the key *e* is left in the slots in the hubs *d'* and 5, connecting them together and causing the tool to receive its motion from the disks *k k'* and wheels *h*; but the pinion-sleeve is disconnected from such cross-key, and the pinion is free to turn with the shaft and act upon the said wheels to revolve the shaft *d* and drill or other article with a slow

motion and with increased power. The case B C inclosing the gears keeps out dust, chips, and foreign substances, so that the parts are kept clean; but this case may be in the form of an open frame; or the internal gear may be supported in any suitable manner, the other parts remaining unchanged. It will be evident that this movement is available in a lathe or other machine for changing the speed, in which case the shaft *a* may be prolonged, as indicated by dotted lines, so as to be supported in bearings 9 at both ends; and the driven shaft *d* be provided with one or more pulleys, 10, also indicated by dotted lines. In this case the clutches and other parts remain the same, and the power may be applied to the pulley 10 to drive the shaft *a* at a faster or slower speed, or the power may be applied to the shaft *d*, so as to drive the pulleys faster or slower.

I claim as my invention—

1. The combination, with the motor-shaft and the driven shaft, of a case supporting the shafts in line with each other, a central pinion, a gear around the inside of the case, intermediate gear-wheels, disks carrying the same, and couplings to connect or disconnect the respective parts, substantially as set forth.
2. The combination, with the motor-shaft and the driven shaft, of a pinion and sleeve upon the motor-shaft, a coupling-ring for moving the pinion endwise, a key upon the motor-shaft, and a key to connect the pinion with the driven shaft, and a female gear wheel and wheels between the same and the pinion, substantially as set forth.
3. The combination, with the motor-shaft and the driven shaft, of a central pinion, a female gear, intermediate gear-wheels, a coupling for connecting or disconnecting the pinion and the motor-shaft, and a key to connect the pinion with the driven shaft, substantially as set forth.
4. The sleeve with a diagonal slot, the shell having a slotted cylinder for receiving the sleeve, a sliding clutch within the shell, a pinion around the motor-shaft, a female gear, intermediate wheels, disks and slotted hubs for supporting the disks, and the arms and key passing into such slots, substantially as set forth.
5. The combination, with the internal or female gear and intermediate wheels, of a motor-shaft, a sleeve and pinion on such shaft, keys and coupling devices, substantially as set forth, for connecting the pinion and the driven shaft or the pinion to the motor-shaft, substantially as set forth, whereby the driven shaft can be coupled and driven either fast or slow, or at the same speed as the motor-shaft, as specified.

Signed by me this 5th day of August, A. D. 1884.

JOHANNES TH. PEDERSEN.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.