

No. 637,705.

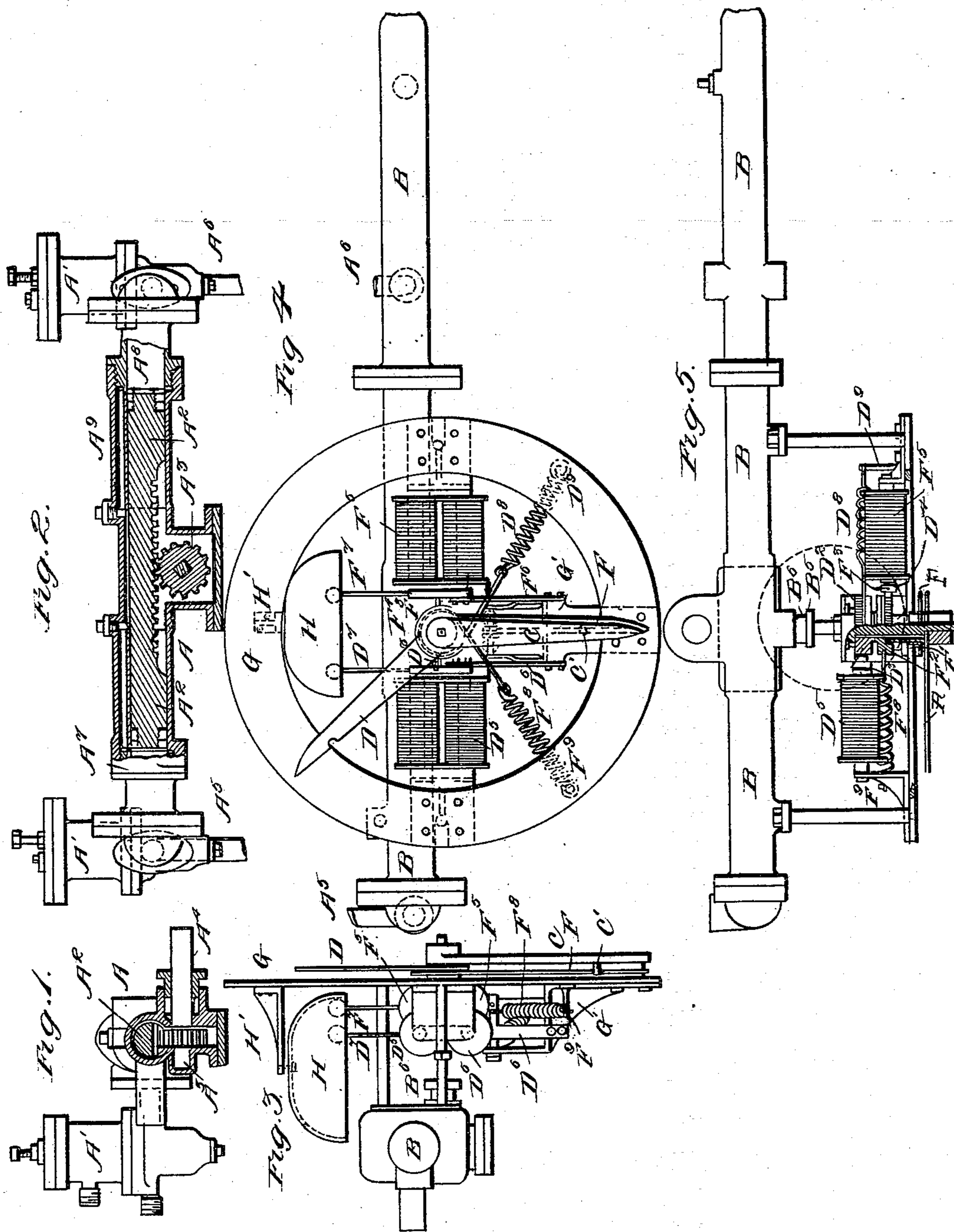
Patented Nov. 21, 1899.

A. B. BROWN.
TELEMOTOR APPARATUS.

(Application filed Dec. 31, 1897.)

(No Model.)

2 Sheets—Sheet 1.



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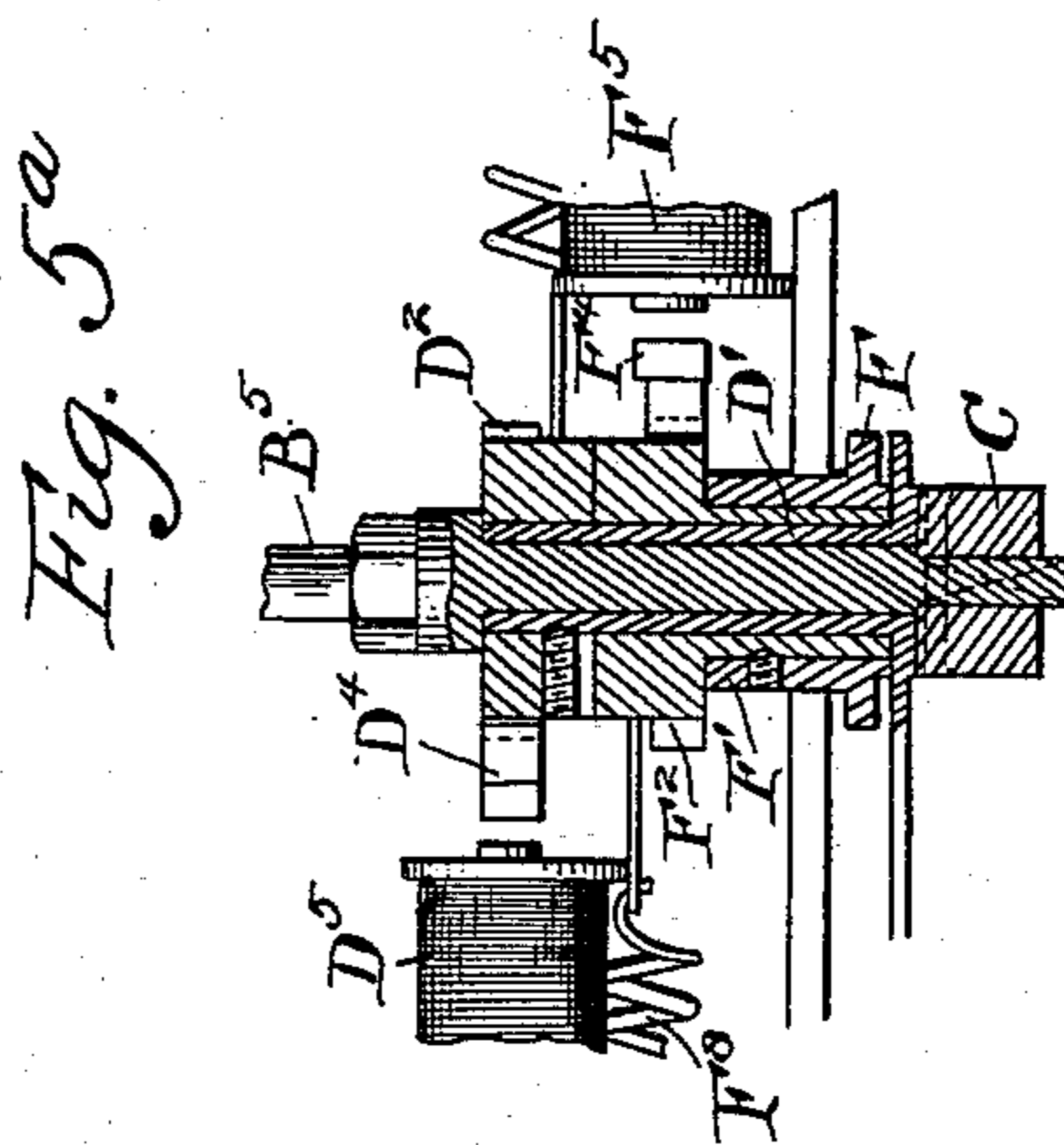
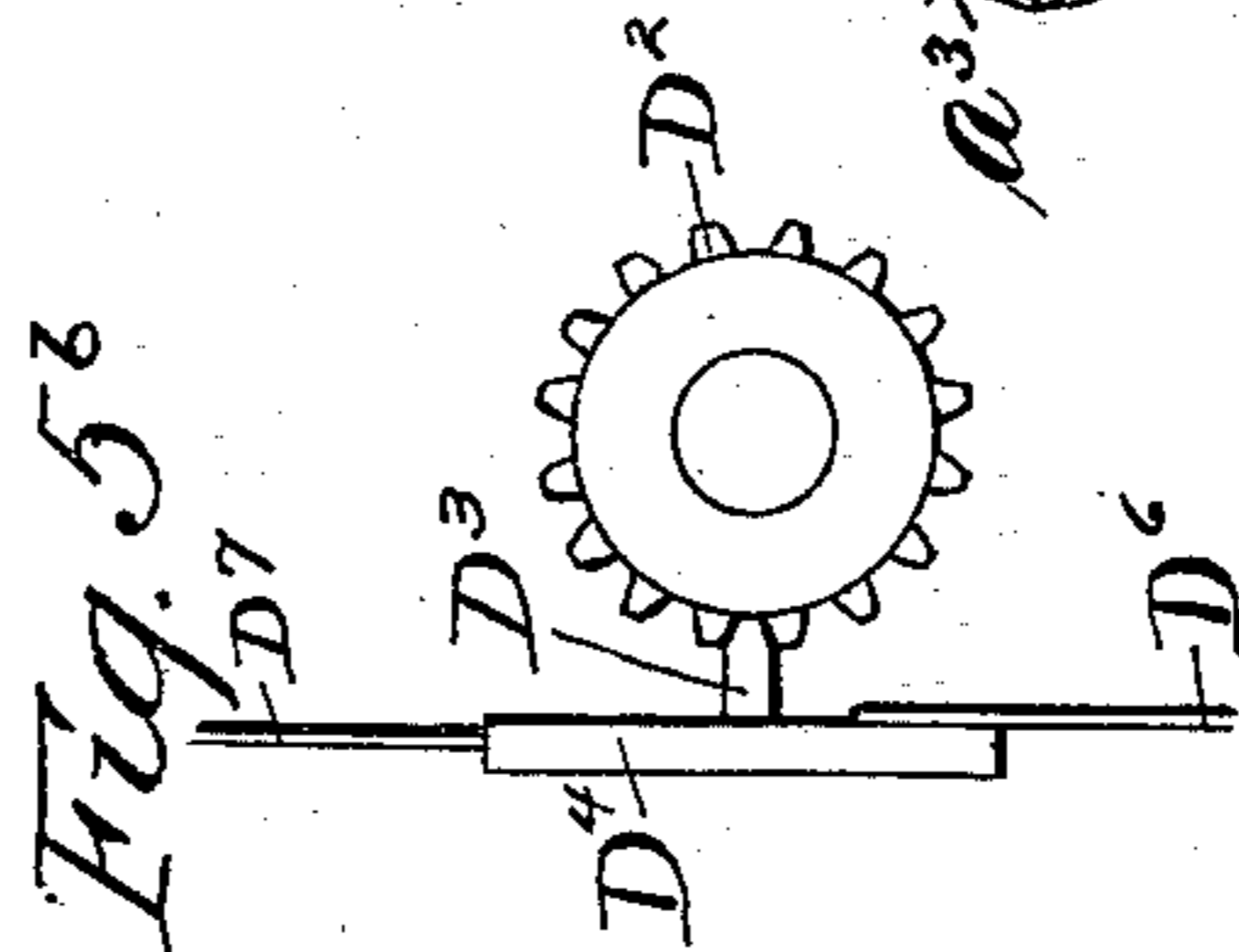
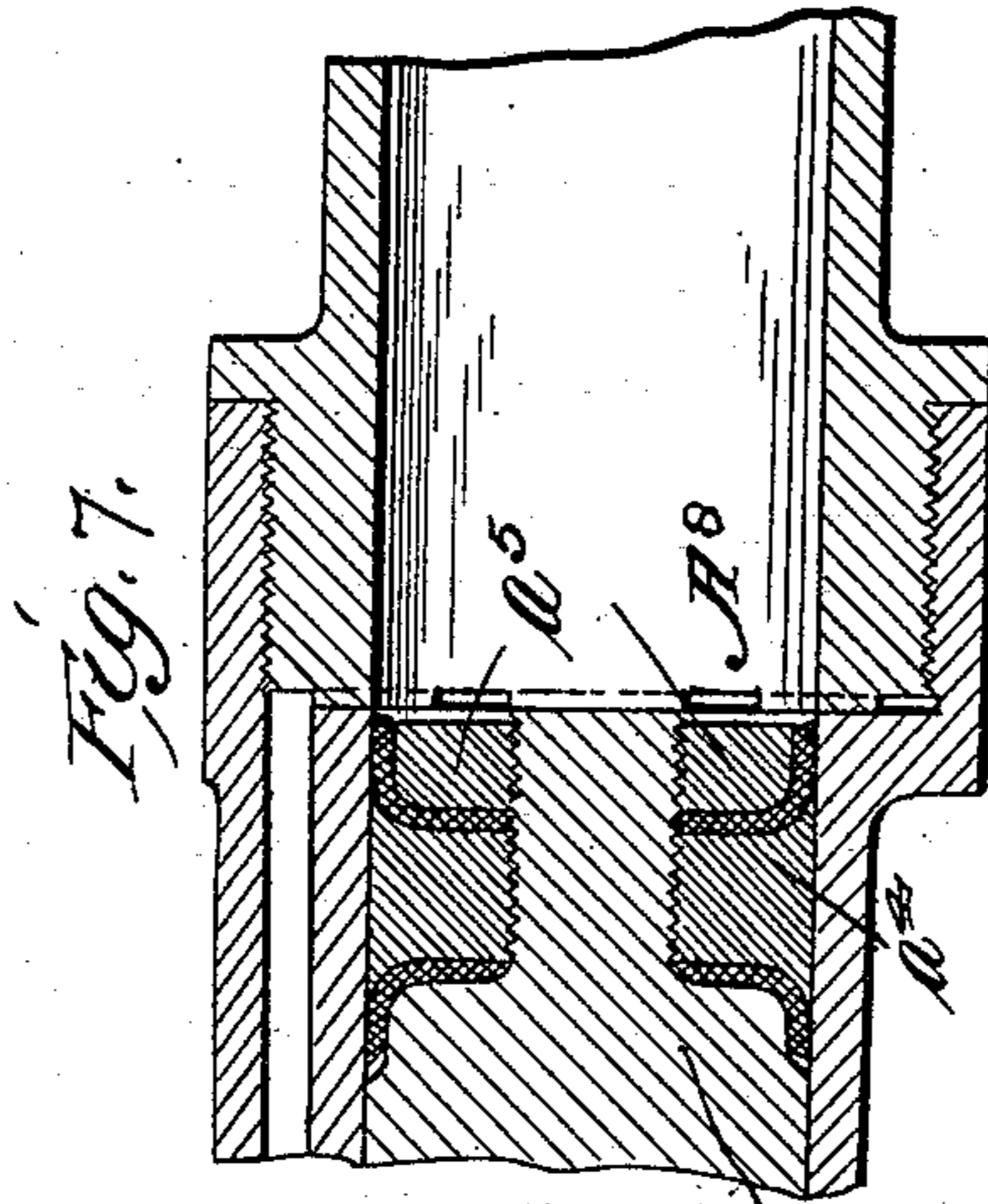
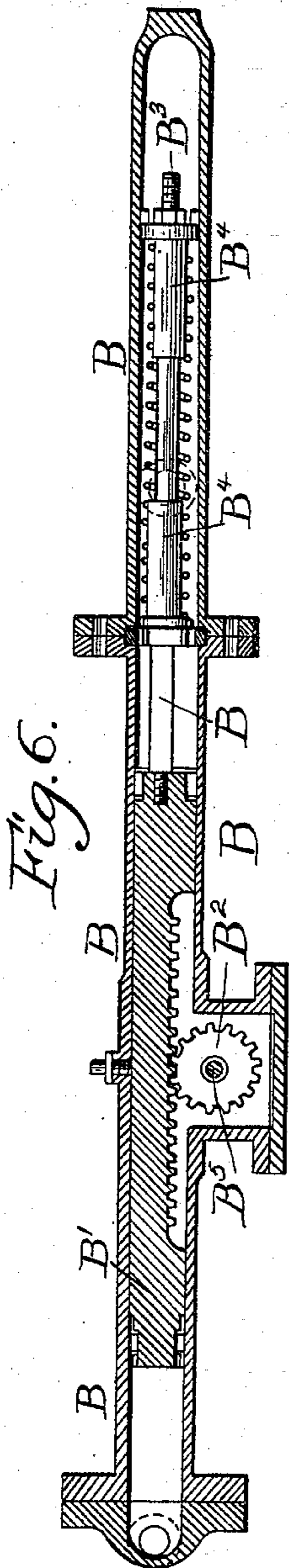
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(No Model.)

2 Sheets—Sheet 2.



Attest:
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UNITED STATES PATENT OFFICE.

ANDREW BETTS BROWN, OF EDINBURGH, SCOTLAND.

TELEMOTOR APPARATUS.

SPECIFICATION forming part of Letters Patent No. 637,705, dated November 21, 1899.

Application filed December 31, 1897. Serial No. 664,801. (No model.)

To all whom it may concern:

Be it known that I, ANDREW BETTS BROWN, of Edinburgh, in the county of Mid-Lothian, Scotland, have invented certain new and useful Improvements in Signaling Apparatus, of which the following is a specification.

My said invention relates to telemotor or signaling apparatus in which movements are transmitted by means of water or other liquids in pipes arranged between the points of transmission and reception in whatever manner may be most convenient in each case, exact correspondence between the transmitting and receiving parts being secured by causing the two pipes through which opposite movements are transmitted to communicate with each other, and thereby have the pressure in them equalized whenever the parts are in their middle positions.

The object of the invention is to provide an apparatus of this nature having devices for indicating a transmitted movement and retaining the indication until certain other movements are transmitted, the invention being designed more especially for conveying signals from the bridge or corresponding part of a vessel to the engine-room.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 of the drawings is a transverse vertical section, and Fig. 2 is a longitudinal vertical section, of the transmitting part of the hydraulic telemotor. Fig. 3 is a side elevation, Fig. 4 a front elevation, and Fig. 5 a sectional plan, of the receiving and indicating parts of the hydraulic telemotor. Fig. 5^a is an enlarged detail view of the central portion of Fig. 5. Fig. 5^b is a detail of one of the wheels, as D², and the corresponding armature. Fig. 6 is a longitudinal vertical section of the receiving part of the hydraulic telemotor drawn to a slightly-larger scale. Fig. 7 is an enlarged sectional view of one end of the transmitting cylinder and piston and showing more clearly the by-pass.

In the drawings the same reference-letters are used to mark the same or like parts whenever they are repeated.

The transmitting part of the hydraulic telemotor (shown in Figs. 1 and 2) consists of a hydraulic cylinder A, provided at each end with a casing A', containing a safety-valve to

allow for excess of pressure. The cylinder A contains a piston A², formed with transverse rack-teeth which gear with a pinion A³, fastened on a spindle A⁴, turned by a suitable handle. (Not shown.) The cylinder A is connected by pipes A⁵ and A⁶ to the receiving part of the hydraulic telemotor and the system is filled with glycerin, oil, or other liquid. The receiving part of the hydraulic telemotor consists of a hydraulic cylinder B, similar to the transmitting-cylinder A and containing a similar piston B' and pinion B². The piston B' has a rod B³ extending from it and inclosed by an extension of the cylinder B, this rod having encircling it a spring B⁴, which is arranged to make the piston B' tend to return to its middle or neutral position. The pinion B² is fastened on a spindle B⁵, which projects out through a stuffing-box B⁶, and has on its outer end a radial arm C. When the transmitting-piston A² is moved, the receiving-piston B' is correspondingly moved by the displaced liquid and by means of its rack-teeth the pinion B² and the spindle B⁵, carrying the radial arm C. On the radial arm C there is fixed a pin C', which acts on one or other of two radial arms or pointers D and F, fixed on bosses or sleeves D' and F', which are loose on the spindle B⁵. One of the pointer-arms D or F is acted on for ahead orders and the other for astern orders, each remaining at rest when the other is moved. On the boss of each pointer-arm D F there is a toothed wheel D² F², with which there engages a catch D³ F³, held by the armature D⁴ F⁴ of an electromagnet D⁵ F⁵, and when either pointer-arm is moved to a position, such as that in which the pointer D is shown in Fig. 4, indicating on a dial G the order transmitted it is retained there by the catch D³ F³, while the spindle-arm C may return to its middle or neutral position, in which it is shown in Fig. 4. When the spindle-arm C is in the position referred to, a communication becomes open between the two telemotor-pipes A⁵ and A⁶ by means of the openings A⁷ and A⁸ and the by-pass A⁹ in the transmitting-chamber A, this communication being arranged to be open when the spindle-arm is at any point within a suitable distance on each side of the middle point, but to be closed by the passage of the ends of the piston beyond the openings or ports A⁷ and

A⁸. The ends of the piston are preferably provided with packing-disks α^3 , secured by nuts α^4 and α^5 . By this arrangement the tubes A⁵ and A⁶ are in communication, and in fact the whole system when said spindle-arm C is in approximately its neutral position. The reason for this is to counteract any possible leakage of liquid passing the pistons, and thereby allowing the one hydraulic piston A² to become out of "position" or correspondence with the other hydraulic piston B², and thereby giving a false reading in the receiver-dial. For example, suppose A² be in the position to establish the communication referred to and B² had leaked and was out of the neutral position, giving a reading on the dial, then the correcting-spring fitted to the end of piston being in compression in one direction or the other will be able to push B² back to its neutral position also on account of a free communication being made throughout the hydraulic system. Hence it will be seen that the whole system cannot get out of adjustment, as it will automatically adjust itself so long as the piston A² shall occasionally be returned to its neutral position, uncovering the by-pass openings at both ends of the cylinder A. The armatures D⁴ F⁴, to which the catches D³ F³ are fixed, are held by spring-blades D⁶ and F⁶, attached to a small bracket G' on the dial G, and the spring-blades have also clappers D⁷ F⁷, arranged to act on a bell H, attached to a small bracket H' on the upper part of the dial. When either pointer-arm D F is moved from the neutral position, the action of its toothed wheel D² F² on the catch D³ F³ causes the armature D⁴ F⁴ to reciprocate and its clapper D⁷ F⁷ to strike the bell H. On the engineer noticing and attending to an order he transmits a suitable reply to the apparatus at the bridge by separate means provided for the purpose, and thereafter the spindle of the engine-room apparatus becomes free to return to its middle position. When the spindle B⁵ is in the middle position into which it has to be moved by means of the transmitting-piston A², which is actuated by hand, a piece (not shown) on it or its arm C makes contact in the electric circuit, which excites the electromagnets D⁵ F⁵, the armatures D⁴ F⁴ of which are thereby made to reciprocate. Each pointer-arm boss D' F' is connected to a spring D⁸ F⁸, attached to studs D⁹ F⁹, fixed in the dial G, the spring being arranged to turn the arm back to the neutral position when not held by the catch D³ F⁴, and as each reciprocation of the armature D⁴ F⁴ withdraws the catch the arm turns back step by step until it reaches the neutral position.

Instead of employing electromagnets D⁵ F⁵ to withdraw the catches D³ F³ and ring the bell H while doing so any suitable mechanical devices may be used. Thus a wire or other rope or cord led from the bridge to the engine-room and there connected to a spring to take up slack may be arranged to act on toggle-levers connected to the catches, so

that they will be moved apart when the rope or cord is pulled, the same or other levers also acting on the bell-clapper.

I claim as my invention—

1. In combination, the transmitting and receiving cylinders and pistons with fluid-pipes connecting said cylinders, the rotary shaft operated by the receiving-piston, the dial, the independently-movable indicating-arms and means carried by the shaft for operating one or the other of said pointers, substantially as described.

2. In combination, the transmitting and receiving cylinders and pistons with fluid-pipes connecting said cylinders, the rotary shaft operated by said receiving-piston, the dial, the independent indicating-arms, means whereby the rotation of the shaft will move one or the other of the arms according to the direction of rotation, and means for temporarily retaining the indicating-arm in its indicating position, substantially as described.

3. In combination, the transmitting and receiving cylinders and pistons, with fluid-pipes connecting said cylinders, the rotary shaft operated by the receiving-piston, the dial, the independently-movable indicating-arms located in proximity to said dial, the projection carried by the shaft adapted to move one or the other of the indicating-arms according to the direction of rotation of the shaft, and means operated independent of the rotation of the shaft for returning the moved indicating-arm to normal position, substantially as described.

4. In combination, the transmitting and receiving cylinders with operating connections, the rotary shaft operated by the receiving-piston, the dial, the indicating-arms loosely mounted on the shaft, the projection carried by said shaft adapted to move one or the other of the indicating-arms according to the direction of rotation, the alarm, means for causing the movement of the arms to sound the alarm, means for retaining each indicating-arm when operated in its indicating position, and means for returning indicating-arms to normal position, substantially as described.

5. In combination, the transmitting cylinders and pistons, the rotary shaft operated by the receiving-piston, the dial, the independent indicating-arms loosely mounted on the shaft, the projection carried by the shaft adapted to move one or the other of the arms according to the direction of rotation, means tending to restore said arms to normal position, toothed wheels carried by the arms, spring-pawls adapted to engage said toothed wheels to hold the arms in indicating position, and means for moving said pawls to release the wheels, substantially as described.

6. In combination, the transmitting cylinders and pistons, the rotary shaft operated by the receiving-piston, the dial, the independent indicating-arms loosely mounted on the shaft, the projection carried by the shaft adapted to move one or the other of the arms

according to the direction of rotation, means
tending to restore said arms to normal posi-
tion, toothed wheels carried by the arms, an
alarm-bell, spring-arms carrying bell-clap-
5 pers, pawls on the spring-arms adapted to be
operated by the movement of the toothed
wheels to sound an alarm and also adapted
to retain the toothed wheels in their moved
positions, armatures carried by the spring-
10 arms, and electromagnets for attracting the
armatures to release the toothed wheels to
allow the indicating-arms to return to normal
position, substantially as described.

7. In combination, the transmitting cylin-
15 der and piston, the rotary and longitudinally-
movable shaft adapted to be rotated by said
receiving-piston, the dial, the indicating-arms
loosely carried by the shaft, a projection hav-

ing a connection with the shaft and adapted
to move one or other of the arms according 20
to the direction of rotation of the shaft, pawls
connected with the indicating-arms, a piece
carried by the shaft adapted to engage said
pawls to hold the arms in indicating position,
and means for moving said shaft longitudi- 25
nally to release the arms and permit them to
return to normal position, substantially as
described.

In testimony whereof I have signed my
name to this specification in the presence of 30
two subscribing witnesses.

ANDREW BETTS BROWN. [L. S.]

Witnesses:

GEORGE COBB,
FREDERICK PIATT.