

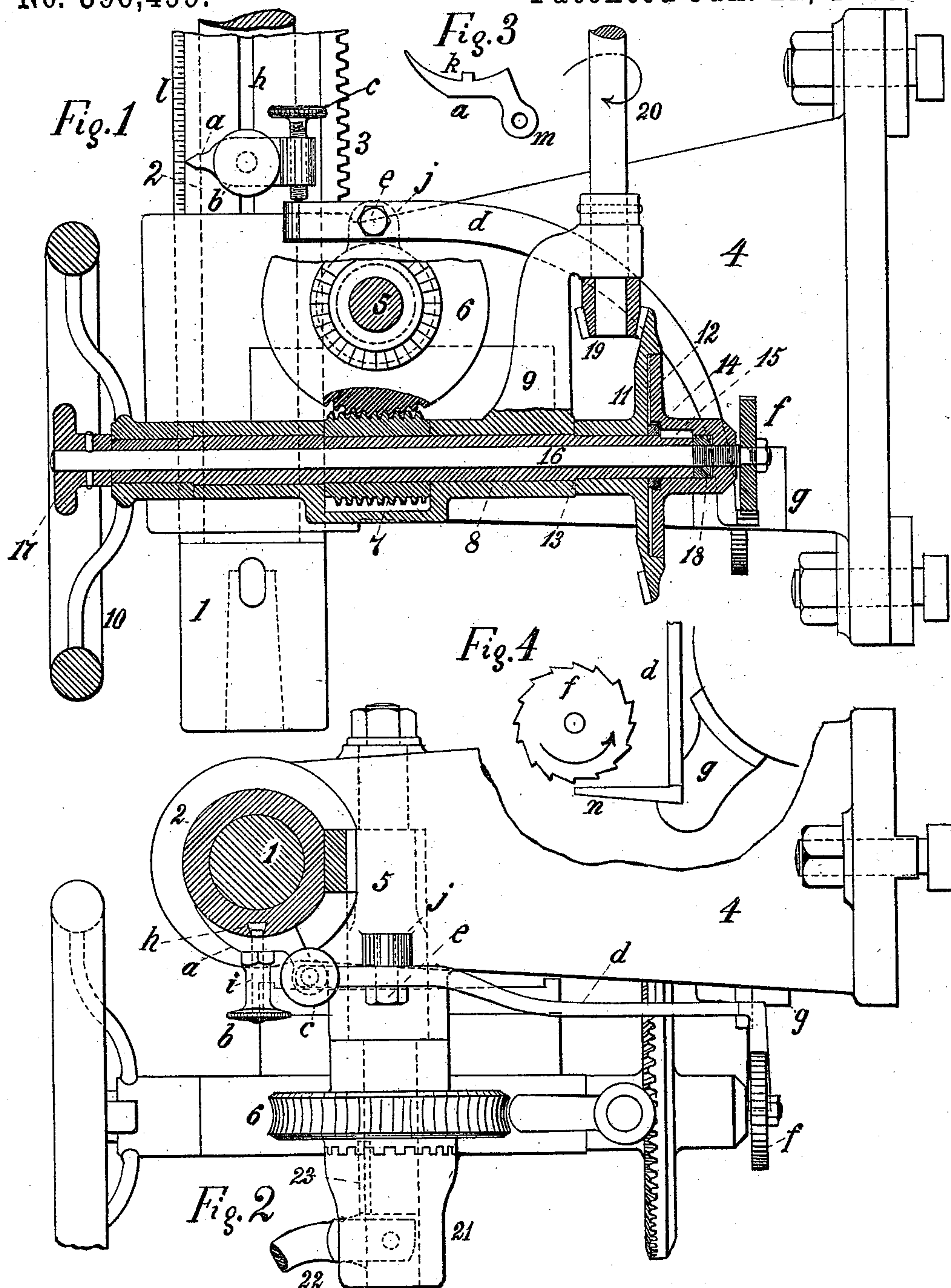
(No Model.)

W. LODGE & C. DAVIS.

AUTOMATIC FEED STOPPING DEVICE FOR DRILLING MACHINES.

No. 396,499.

Patented Jan. 22, 1889.



WITNESSES:

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INVENTORS:

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# UNITED STATES PATENT OFFICE.

WILLIAM LODGE AND CHARLES DAVIS, OF CINCINNATI, OHIO.

AUTOMATIC FEED-STOPPING DEVICE FOR DRILLING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 396,499, dated January 22, 1889.

Application filed September 24, 1888. Serial No. 286,261. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM LODGE and CHARLES DAVIS, citizens of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Drilling-Machines, of which the following is a specification.

Our invention relates to the feeding mechanism in drilling-machines; and it consists of a new and useful automatic feed-stopping device to be used in connection with the ordinary feed mechanism.

In the accompanying drawings, Figure 1 shows a longitudinal section through an ordinary feeding device attached in the usual way to the front or sliding head of an upright drilling-machine and our invention in connection with it. Fig. 2 is a top view of Fig. 1. Fig. 3 shows a top view of pointer *a*; and Fig. 4 is an end view of the combination of ratchet-wheel *f*, lever *d*, and bracket *g*, belonging to our invention.

Similar letters refer to similar parts throughout the several views.

The usual drill-spindle, 1, with sleeve 2 and rack 3, is guided by the sliding head 4 and fed by the pinion-shaft 5. Loose on shaft 5 runs worm-wheel 6, but can be connected with it by means of half-clutch 21, sliding endwise on the same shaft and prevented from turning by feather 23. Worm-wheel 6 engages with worm 7, fixed on shaft 8, and said shaft is journaled in bracket 9, secured in a suitable way to head 4. On the front end of shaft 8 is secured the hand-wheel 10, and on its rear end runs loose the bevel-wheel 11, forming the female part of clutch 12, and is kept in place by shoulder 13 and fixed collar 14 on shaft 8. Half-clutch 12 slides freely lengthwise on shaft 8, but is kept from turning by a feather, 15. The shaft 8 is bored its entire length and receives rod 16, to the front end of which is secured the knob 17, and on its rear end the ratchet-wheel *f*. Next to ratchet-wheel *f* right-hand thread is cut on rod 16, to which the outer end of male clutch 12 forms the nut, and by means of knob 17 and by fixed nut 18 said rod is contained in shaft 8, but can revolve freely.

Bevel-wheel 11 is driven by a pinion, 19, and shaft 20, and the impetus of movement is obtained in the usual way, either from the

drill-spindle or driving-shaft of the drilling-machine. Into the outside of sleeve 2 is worked a dovetail or T-shaped groove, *h*, adapted to receive the similarly-formed head of screw *i*, having as nut the knob *b*. A pointer, *a*, fitting to the circular form of sleeve 2 and sliding with its tongue in groove *h*, can be set and tightened by virtue of screw *i* and knob *b* to any line of the graduation *l* on sleeve 2. The radial extension *m* on pointer *a* is tapped and receives an adjusting-screw, *c*, by which means the depth of the hole to be drilled can be regulated without resetting the pointer *a*. On top of sliding head 4 is cast a lug, *j*, which receives the screw *e*, forming the fulcrum for lever *d*. Lever *d* reaches with its front end beneath adjusting-screw *c*, and toward its rear end has a circular bend to miss bevel-wheel 11, and is so bent and shaped on its extreme rear end as to form a pawl, *n*, for ratchet-wheel *f*. A small bracket, *g*, screwed on the sliding head 4, serves as support for lever *d* on its rear end.

Now, when it is desired to feed the drill-spindle to a certain depth, the drill is brought by means of hand-wheel 10 with its point to the work, and the pointer *a*, with adjusting-screw *c*, set and tightened, with assistance of the graduation, the required distance from top of the lever *d* to sleeve 2. Then the knob 17 in front of the hand-wheel is turned to the right, and, being connected by rod 16 with male clutch 12, draws this into the female part of clutch 11. The latter being constantly in motion carries, by virtue of the friction between the taper surfaces, male clutch 12, shaft 8, with worm 7, and rod 16 with it, and thus feeds the drill. In the downward movement of sleeve 2 the lower point of adjusting-screw *c* strikes the lever on top of its front end, and thus lifting up its rear end the pawl-shaped form of it comes in contact with ratchet-wheel *f*. The latter, revolving in the direction shown by the arrow, will be stopped, and consequently the male clutch 12, having right-hand thread, unscrews on rod 16 and withdraws from female clutch 11, for the motion of said clutches is not retarded. Enough loosened that the friction between the clutches does not overcome the resistance caused by the cutting-drill, male clutch 12 stops in its motion and the whole feeding mechanism with it.

Having thus described the mode of operation, we claim as new, and desire to secure by Letters Patent, the following:

1. In a drilling-machine, an axial dovetail  
5 or T-shaped groove, *h*, worked into the outside of sleeve 2, an axial graduation in inches and their fractions cut on the outside of said sleeve, and a pointer, *a*, fitting to the circular  
10 form of sleeve 2, sliding with its tongue in groove *h*, having a radial extension, *m*, to receive an adjusting-screw, *c*, in combination with pointer *a*, a screw, *i*, sliding with its head  
15 in groove *h*, and a knob, *b*, serving as nut for said screw, adapted to tighten said pointer to sleeve 2, all substantially as described, and  
for the purpose specified.

2. In a drilling-machine, a lever, *d*, fulcrumed on the sliding head 4 and so shaped  
20 as to come on its front end in contact with an adjusting-screw, *c*, attached by virtue of pointer *a* to sleeve 2, and form on its rear end

a pawl, *n*, to engage with a ratchet-wheel, *f*, secured to rod 16 in the feed mechanism, and a bracket, *g*, secured to the sliding head 4 and serving as support for the rear end of lever *d*,  
25 all substantially as set forth, and for the purpose specified.

3. In the feed mechanism of a drilling-machine, the combination of a hollow worm-shaft, 8, with rod 16 revolving within its bore,  
30 said rod having on its front end a fixed actuating-knob, 17, on its rear end a fixed collar or nut to keep it in place, a thread to engage with half-clutch 12, and a fixed ratchet-wheel, *f*, to engage with a lever, *d*, fulcrumed on the  
35 sliding head of a drilling-machine, all substantially as described.

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Witnesses:

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