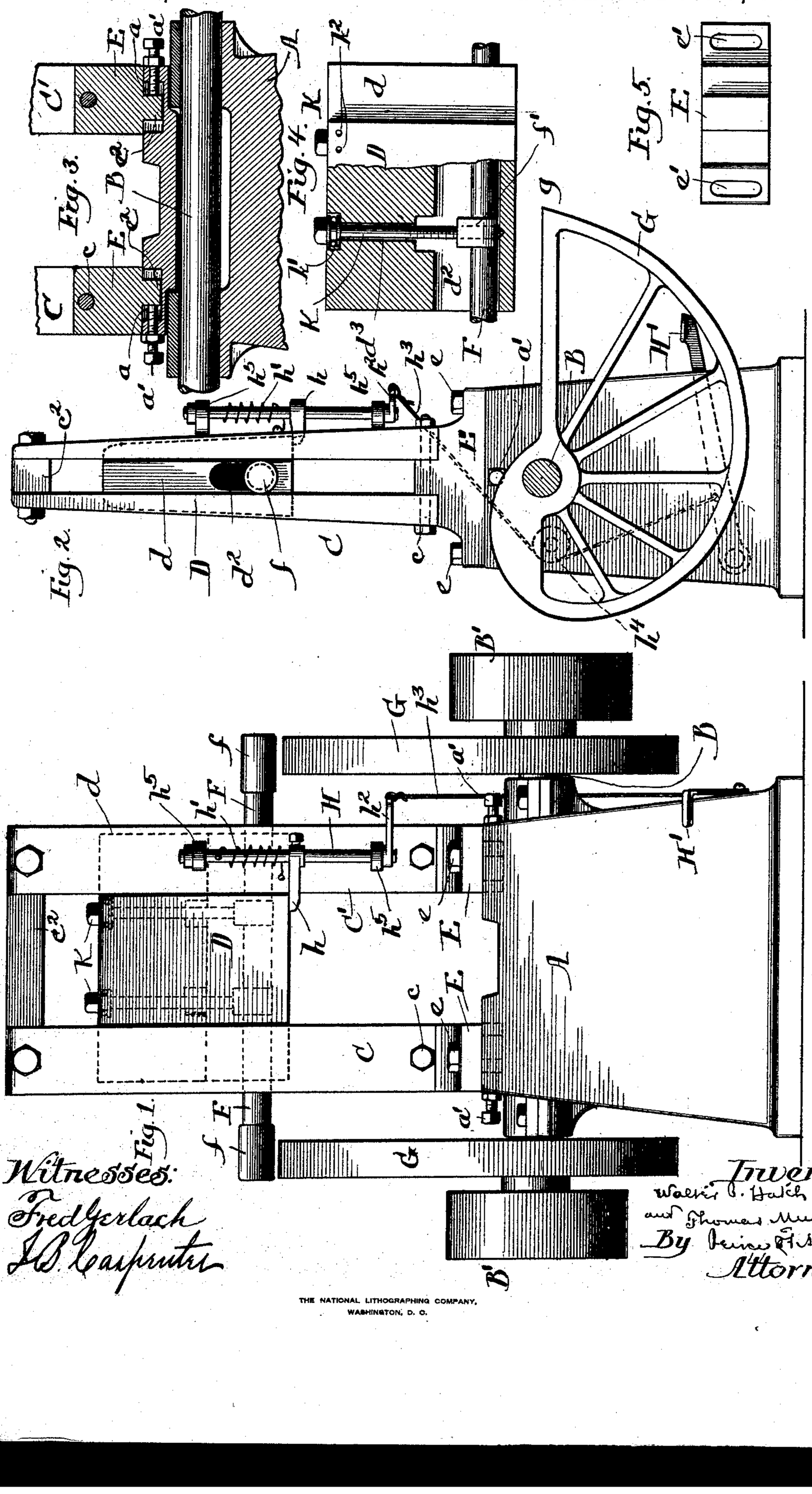
(No Model.)

W. P. HATCH & T. MURPHY

DROP HAMMER.

No. 509,897. Patented Dec. 5, 1893.



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DROP-HAMMER.

SPECIFICATION forming part of Letters Patent No. 509,897, dated December 5, 1893.

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To all whom it may concern:

Be it known that we, WALTER P. HATCH and THOMAS MURPHY, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Drop-Hammers, of which we do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

Our present invention has for its object to provide a simple, cheap and effective mechanism for operating the hammers of drop forges and to this end our invention consists in the novel features of construction hereinafter described, illustrated in the accompanying drawings and particularly pointed out in the claims at the end of this specification.

Figure 1 is a front view of a drop forge embodying our improvements. Fig. 2 is an end view of the same. Fig. 3 is a view in vertical longitudinal section through the drive shaft and superposed parts. Fig. 4 is a view partly in elevation and partly in vertical section through the drop hammer. Fig. 5 is a detail plan view of the adjustable block to which the vertical guides are secured.

A designates the base or anvil of the forge in the upper part of which is journaled the drive shaft B. Upon the top of the base, A are sustained the guide ways C and C′ in which moves the drop hammer D, this hammer having reduced portions *d* that enter the slots or grooves in said guide ways. Preferably the guide ways C and C′ instead of being fastened directly to the base or anvil A have their lower ends bolted as at *c* to the shoes or blocks E which in turn are connected by bolts *e* to the top of the anvil A. In order to permit the guide ways to be adjusted laterally, the flanges of the shoes or blocks E are provided with slots *e′* through which the bolts *e* pass, and each of these shoes E has an extension e^2 entering a slot or channel *a* in the top of the anvil A. Through the ends of the anvil A pass the adjusting screws *a′* which bear against the projections e^2 of the shoes or blocks E, and the perforations through which the screws *c* pass are threaded so that by means of these screws the guide ways can be shifted laterally in order to bring the hammer and the die that will be carried thereby into exact alignment with the female die that will be carried upon the top of the anvil A. The guide ways C are bolted at their upper ends to the cross bars c^2, as seen in Figs. 1 and 2, of the drawings. Preferably through the hammer D passes a shaft or stud F by preference provided at each end with a friction roll *f* and these friction rolls *f* will ride upon the face of the cams G that are keyed to the drive shaft B at each side of the anvil, the preferred shape of these cams being illustrated more particularly in Fig. 2 of the drawings. That is to say, the periphery of each of these cams G is of gradually increasing curvature from its beginning until it terminates in the abrupt shoulders *g*.

From the construction as thus far defined, it will be seen that as the drive shaft B is revolved (motion being imparted thereto, preferably by suitable pulleys B′) corresponding revolution will be imparted to the cams G, and these cams will cause the hammer D to be lifted until the friction rolls *f* pass off the abrupt shoulders *g* of the cams, thus permitting the hammer to freely drop.

In order to permit the operator to conveniently hold the hammer D in elevated position, we prefer to attach to one of the guide ways C′ a stop or check consisting preferably of a rock shaft H having a dog *h* adapted to project beneath the hammer D and prevent its descent, and upon this shaft H is mounted a coiled spring *h′* which serves to turn the dog *h* normally into position beneath the hammer D. To the lower end of the shaft H is attached the crank h^2 over which will lead a cord h^3 that in turn passes over a friction pulley h^4 and is connected to a treadle H′ in convenient reach of the operator's foot. The shaft H is journaled in suitable projections or brackets h^5, and the face of the guide way C′. Hence it will be seen that so long as the operator depresses the treadle H′, the drop hammer D will be free to fall as often as it is raised by the cams G, but when the foot of the operator is raised from the treadle, the coiled spring *h′* will cause the dog *h* to pass beneath and arrest the further dropping of the hammer D. In order to vary the extent of drop and consequent force of stroke of

the hammer D the hammer D is preferably formed with the long transverse slot d^2 through which the shaft or stud F passes, and the adjustment of the shaft or stud F within the slot d^2 is effected by means of the screw bolts K which pass through perforations, d^3, formed in the hammer, and through threaded perforations formed in the squared portions f' of the shaft or stud F. Each of the screw bolts K has its upper ends expanded and provided with the annular groove k' through which will pass the pins k^2 that pass also through the top of the hammer and serve to connect the screw bolts to the hammer, while at the same time permitting these bolts to be freely turned in order to effect the adjustment of the shaft F. Hence it will be seen that when a full drop or stroke of the hammer D is desired, the shaft F will occupy the position at the bottom of the slot D as shown in the drawings, but when a shorter drop and consequently lighter stroke of the hammer is required, the screw bolts K will be turned so as to bring the shaft F to a higher position within the slot d^2 of the hammer.

It will be understood by those familiar with this class of devices that the male and female dies will be attached respectively to the bottom of the hammer D and the top of the anvil A, and in order to bring these dies into exact alignment, the guide ways C by which the hammer is carried can be adjusted laterally by means of the screw bolts a.

It is manifest that the exact details of construction above set out may be modified within wide limits without departing from the spirit of the invention and that certain features of the invention may be employed without its adoption as an entirety.

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

1. In a drop hammer forge the combination with the hammer and suitable guides therefor, and a stud projecting at each side of the hammer, cams for engaging said stud and a shaft carrying said cams, said shaft being located beneath the limit of the hammer stroke and in substantially the line of travel of the hammer stud, whereby a direct lift will be imparted by the cams to the hammer stud, substantially as described.

2. In a drop forge the combination with a base and a shaft extending through said base and provided at its ends with cams, of a hammer having an opening formed there through from side to side to receive a stud or shaft, and whereby said stud or shaft is united to the hammer, suitable guides for said hammer, a stud or shaft F extending through said hammer and projecting beyond the sides thereof and cams for engaging the ends of the stud or shaft to raise the hammer, substantially as described.

3. In a drop forge the combination with the hammer and suitable guides therefor and a stop for checking the descent of the hammer consisting of a vertical rock shaft H journaled in suitable brackets h^5 projecting from one of the guides, said rock shaft carrying a coiled spring h' and a dog h, a crank h^2 connected to said rock shaft, and a treadle H' connected to said crank, substantially as described.

4. In a drop-forge, the combination of a hammer D having a slot d^2 therein, a shaft or stud F adjustably connected with said hammer D and cams G adapted to engage with said shaft F, substantially as described.

5. In a drop forge the combination with the hammer and the anvil, of connected guide-ways for the hammer and set screws at the lower ends of said guide-ways whereby they may be simultaneously adjusted in lateral direction, substantially as described.

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