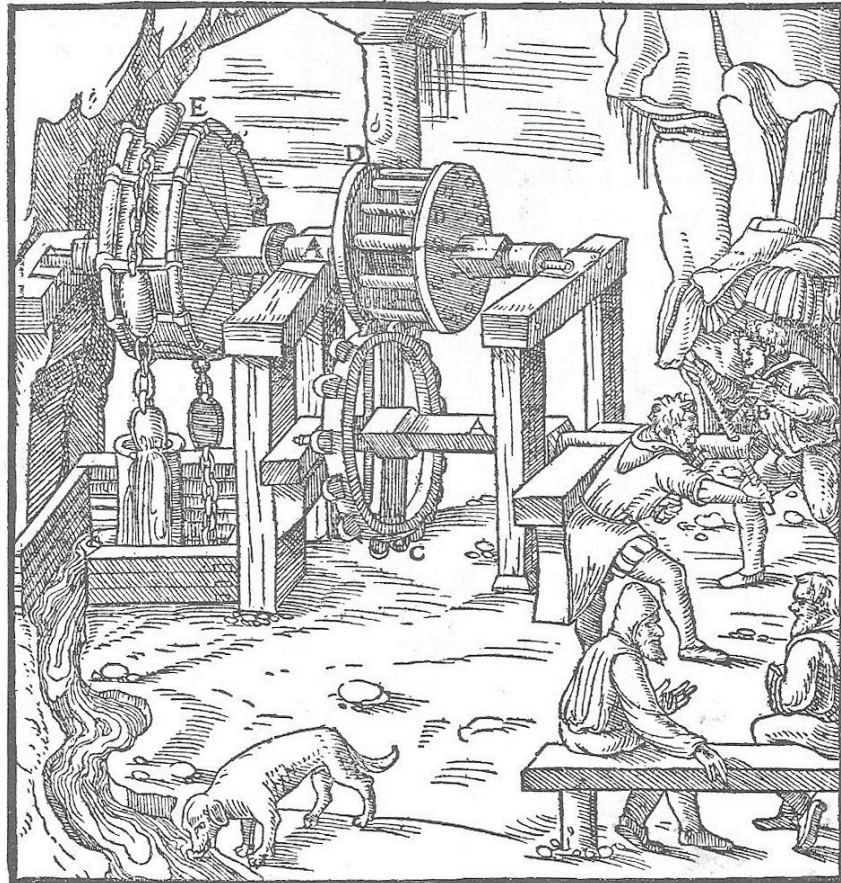


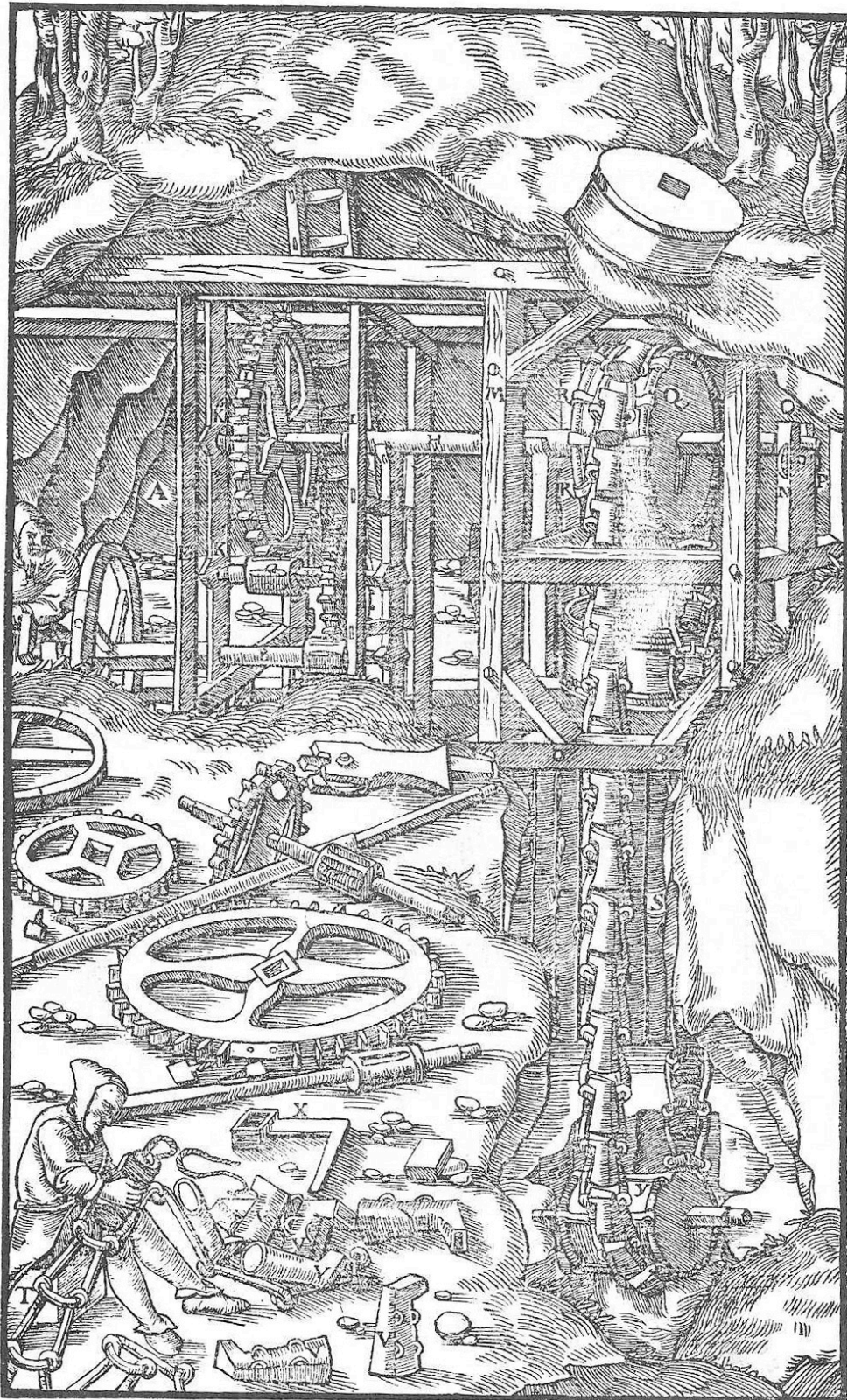
PUMPS & PUMPING MACHINERY 1500 BC-1960

16th Century German Pumps

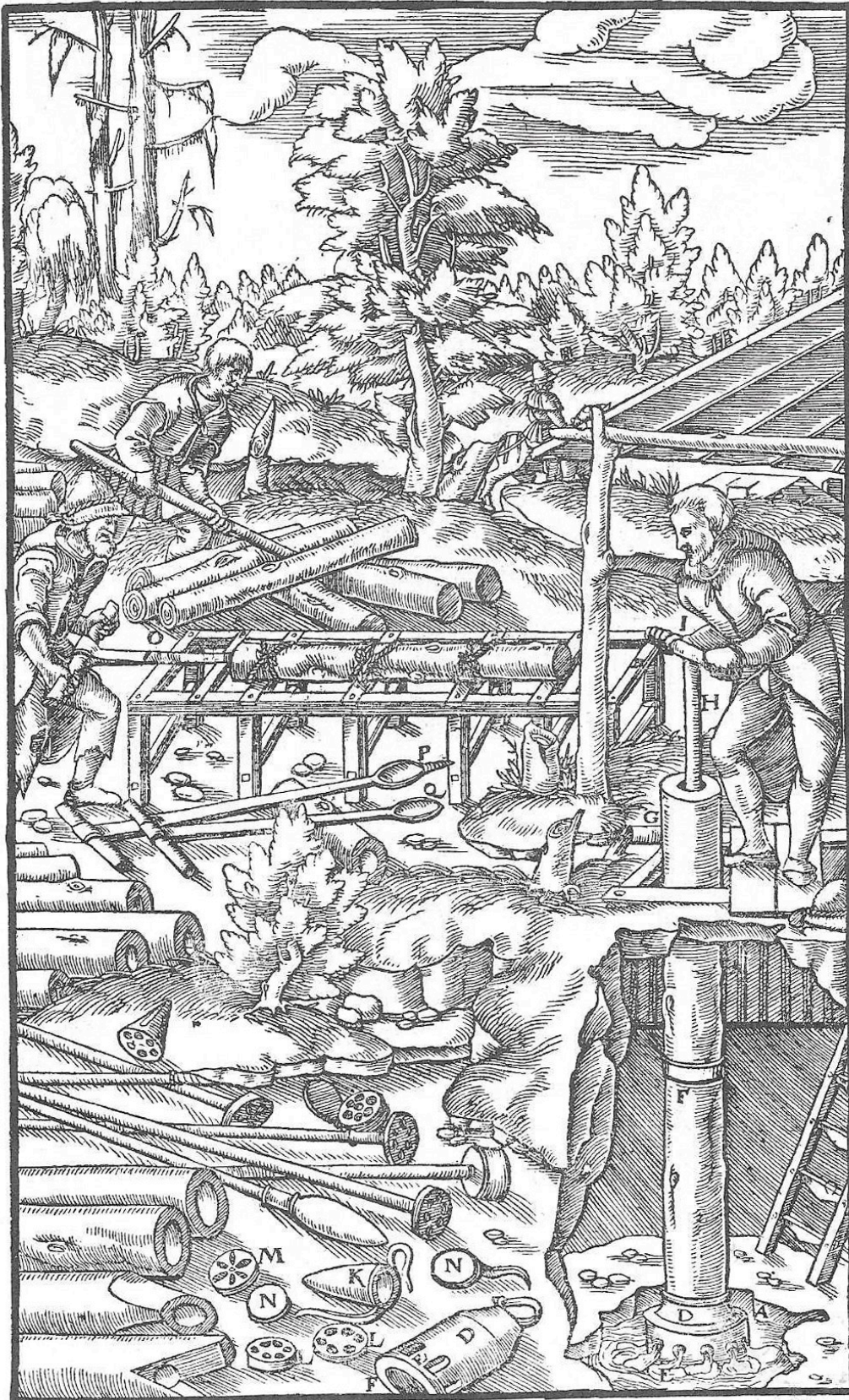


A—AXLES. B—LEVERS. C—TOOTHED DRUM. D—DRUM MADE OF RUNDLES.
E—DRUM IN WHICH IRON CLAMPS ARE FIXED.

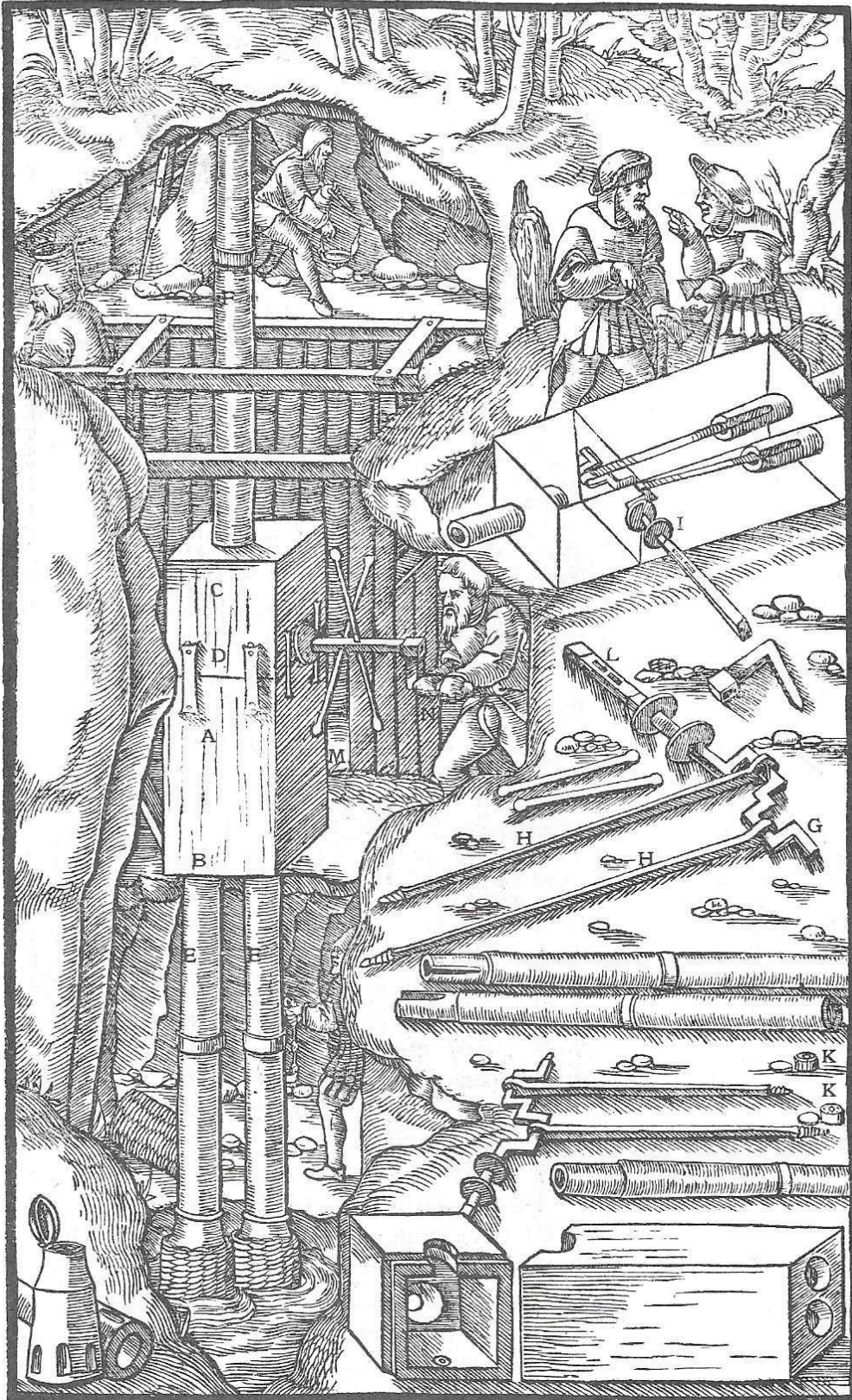
From the book *DE RE METALLICA*, 1500



A—IRON FRAME. B—LOWEST AXLE. C—FLY-WHEEL. D—SMALLER DRUM MADE OF RUNDLES. E—SECOND AXLE. F—SMALLER TOOTHED WHEEL. G—LARGER DRUM MADE OF RUNDLES. H—UPPER AXLE. I—LARGER TOOTHED WHEEL. K—BEARINGS. L—PILLOW. M—FRAMEWORK. N—OAK TIMBER O—SUPPORT OF IRON BEARING P—ROLLER. Q—UPPER DRUM. R—CLAMPS. S—CHAIN. T—LINKS. V—DIPPERS X—CRANK. Y—LOWER DRUM OR BALANCE WEIGHT.

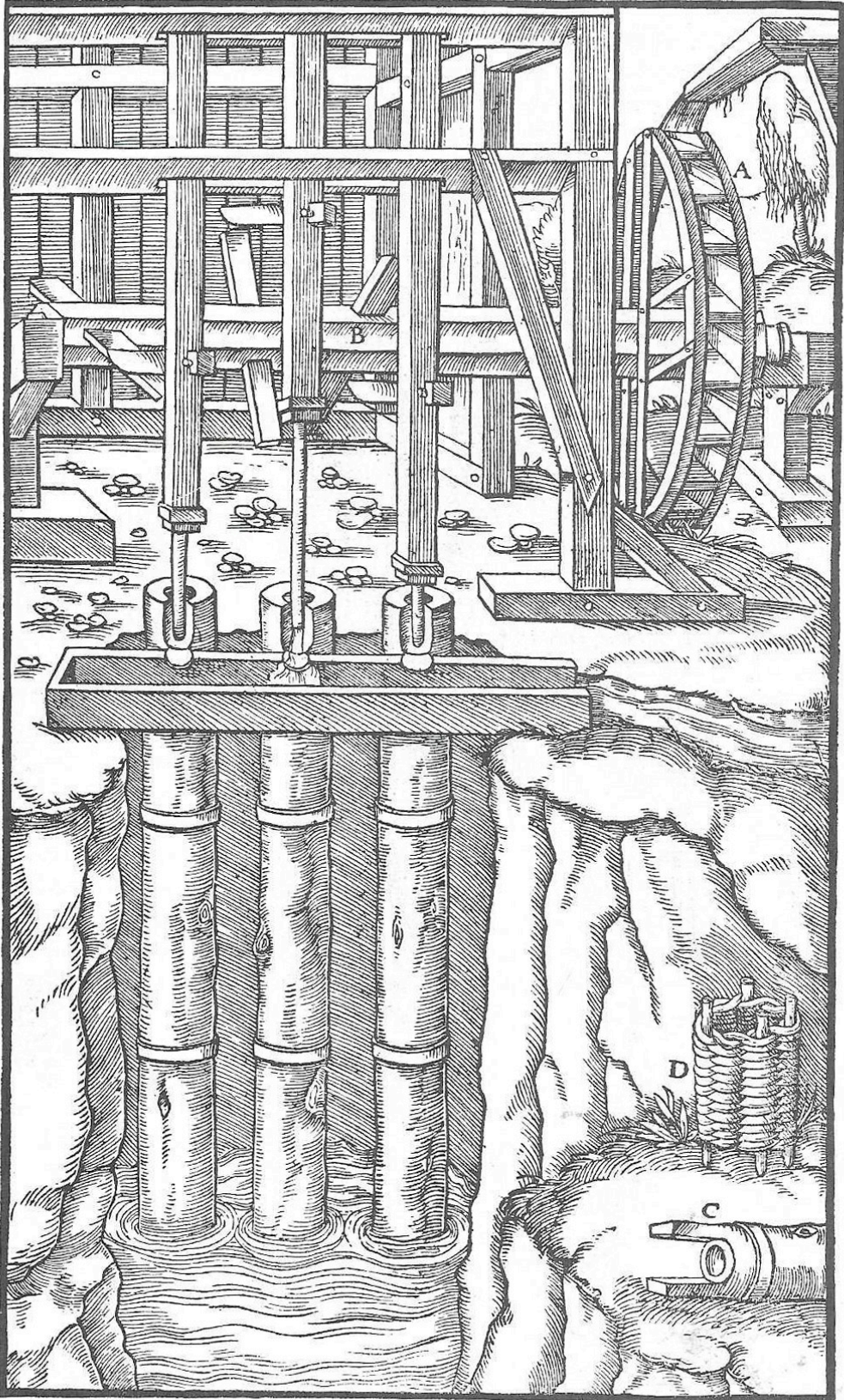


A—SUMP. B—PIPES. C—FLOORING. D—TRUNK. E—PERFORATIONS OF TRUNK. F—VALVE. G—SPOUT. H—PISTON-ROD. I—HAND-BAR OF PISTON. K—SHOE. L—DISC WITH ROUND OPENINGS. M—DISC WITH OVAL OPENINGS. N—COVER. O—THIS MAN IS BORING LOGS AND MAKING THEM INTO PIPES. P—BORER WITH AUGER. Q—WIDER BORER.

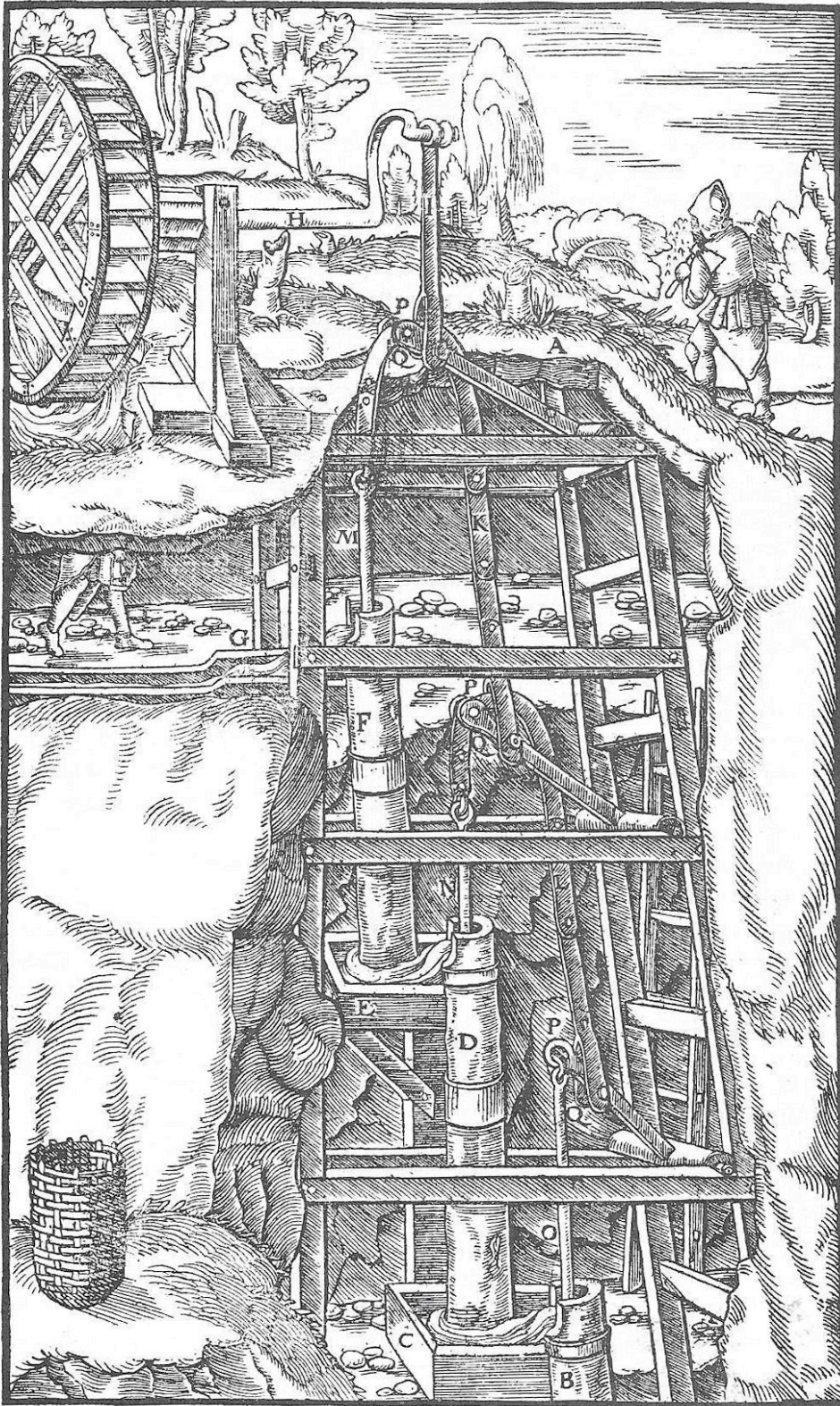


A—BOX B—LOWER PART OF BOX. C—UPPER PART OF SAME. D—CLAMPS. E—PIPES BELOW THE BOX. F—COLUMN PIPE FIXED ABOVE THE BOX. G—IRON AXLE. H—PISTON-RODS. I—WASHERS TO PROTECT THE BEARINGS. K—LEATHERS. L—EYES IN THE AXLE. M—RODS WHOSE ENDS ARE WEIGHTED WITH LUMPS OF LEAD. N—CRANK.

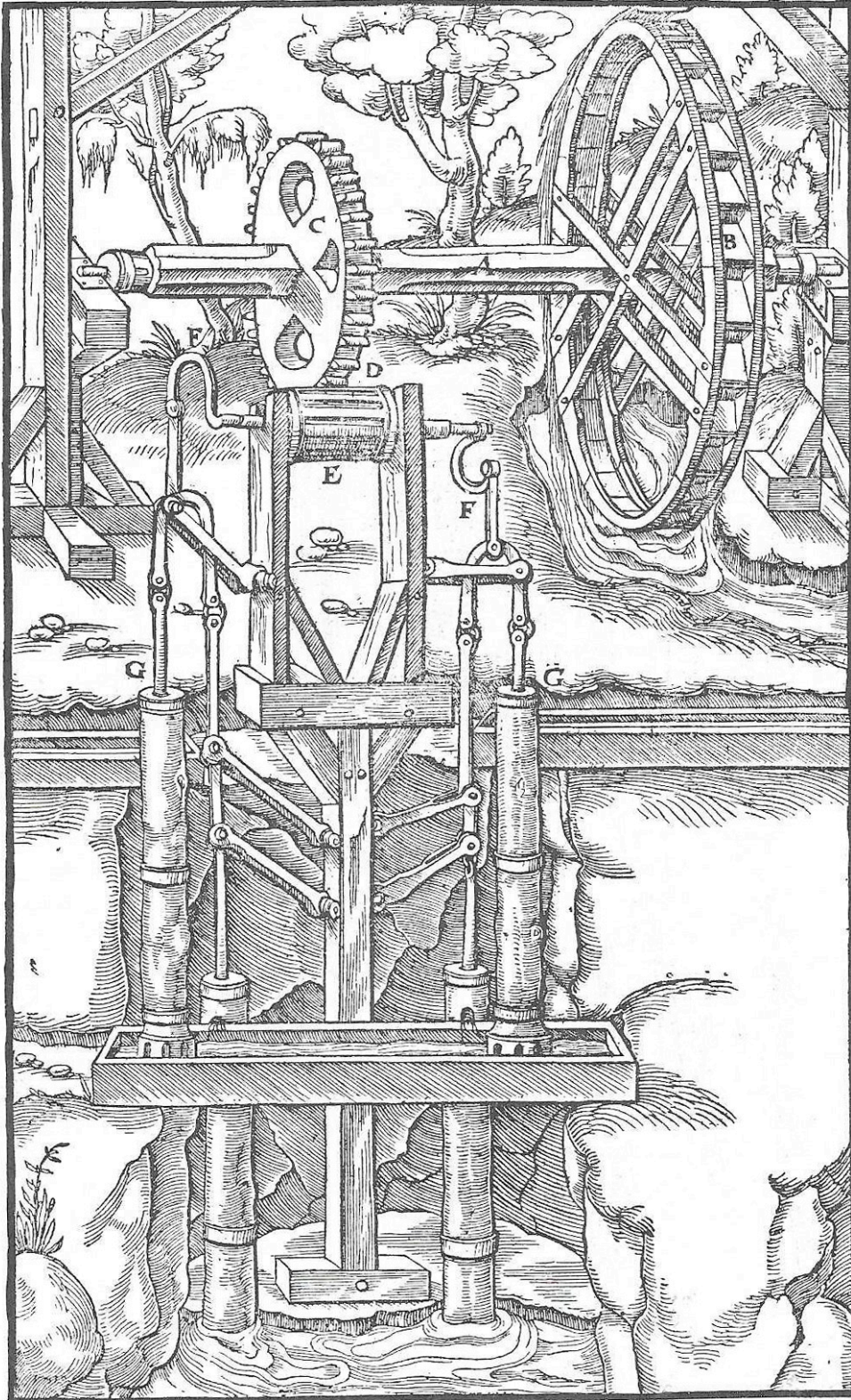
(This plate is unlettered in the first edition but corrected in those later.)



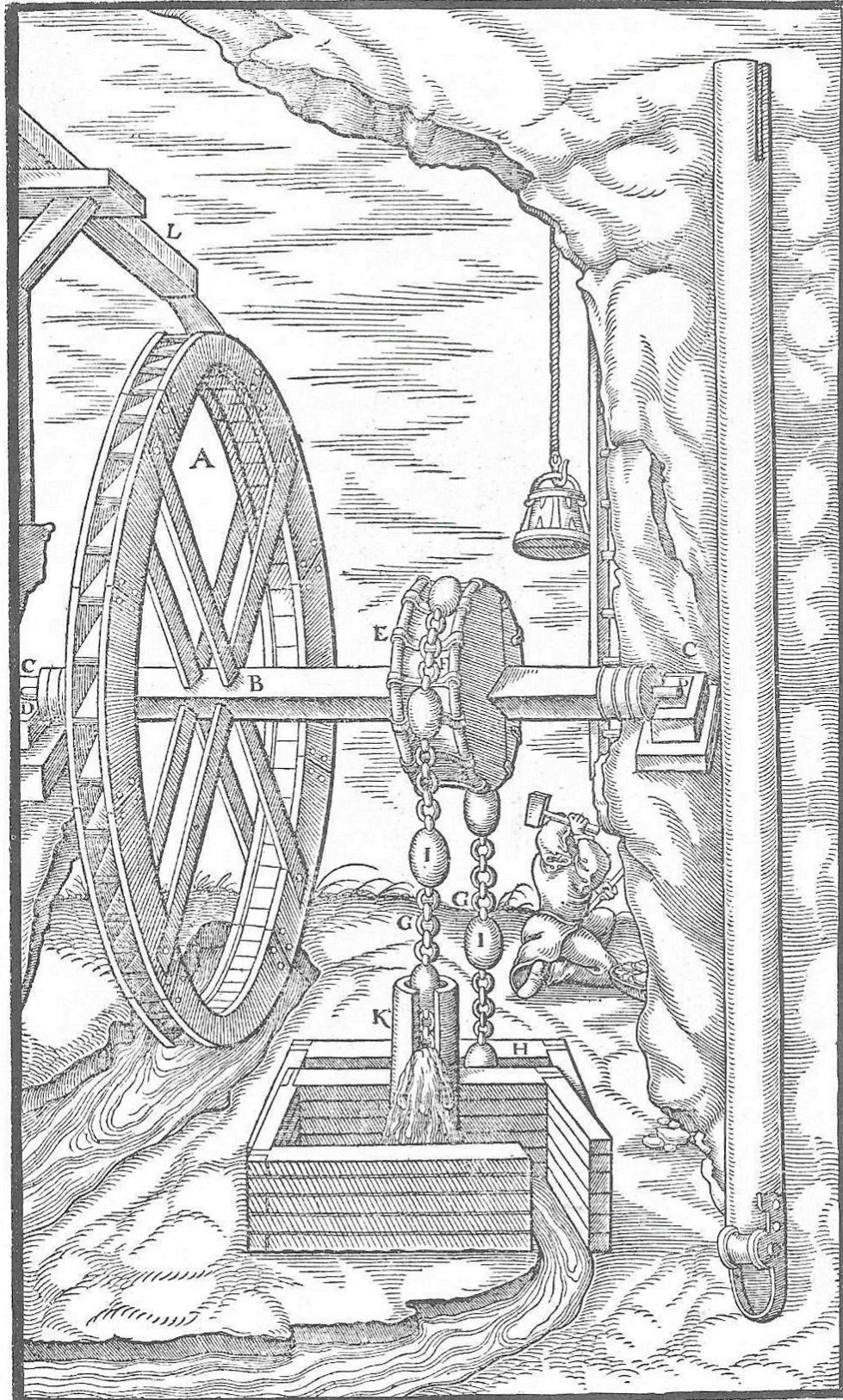
A—WATER-WHEEL. B—AXLE. C—TRUNK ON WHICH THE LOWEST PIPE STANDS.
D—BASKET SURROUNDING TRUNK. (Sixth kind of pump—see p. 184.)



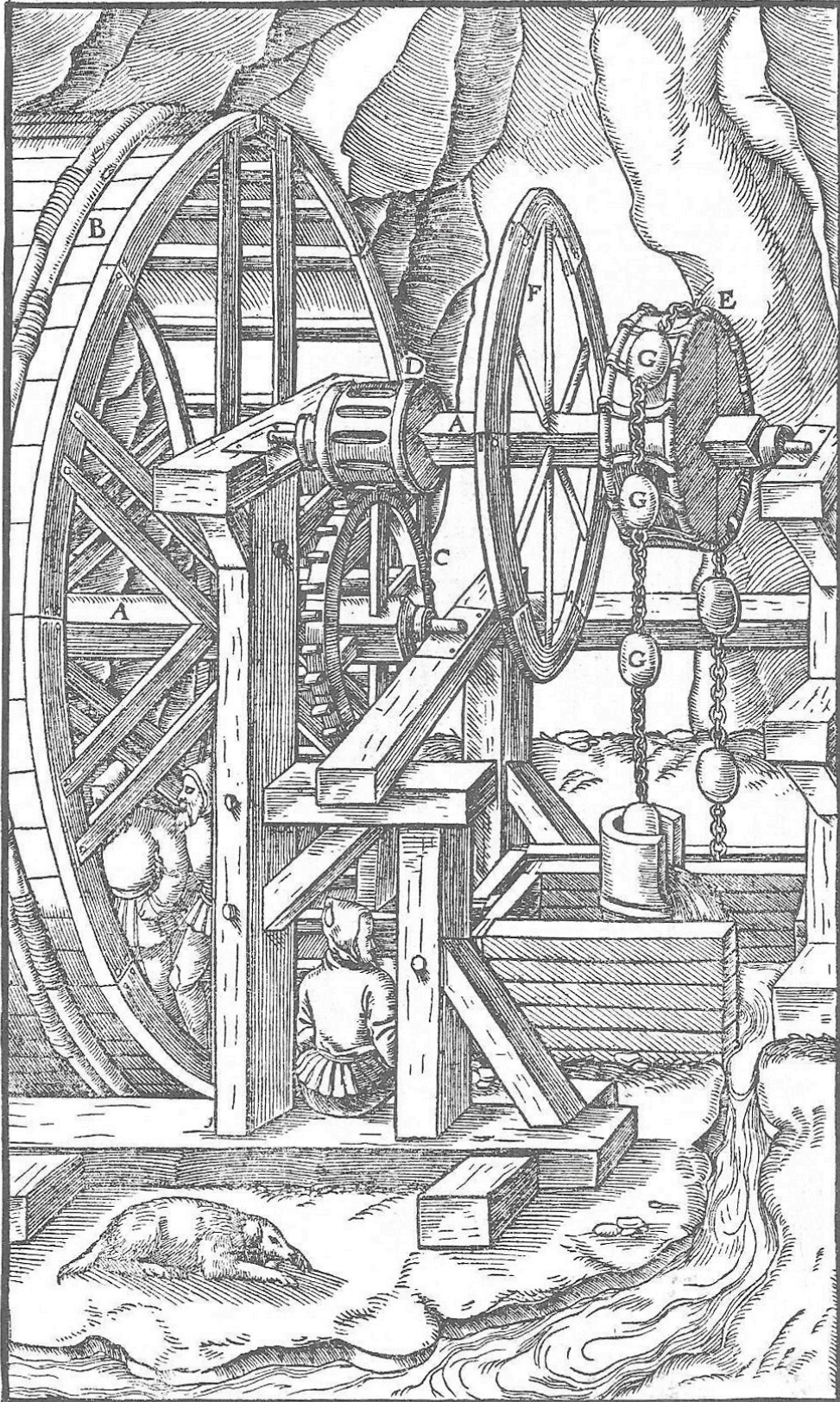
A—SHAFT. B—BOTTOM PUMP. C—FIRST TANK. D—SECOND PUMP. E—SECOND TANK.
 F—THIRD PUMP. G—TROUGH. H—THE IRON SET IN THE AXLE. I—FIRST PUMP ROD.
 K—SECOND PUMP ROD. L—THIRD PUMP ROD. M—FIRST PISTON ROD. N—SECOND
 PISTON ROD. O—THIRD PISTON ROD. P—LITTLE AXLES. Q—“CLAWS.”



A—UPPER AXLE. B—WHEEL WHOSE BUCKETS THE FORCE OF THE STREAM STRIKES.
 C—TOOTHED DRUM. D—SECOND AXLE. E—DRUM COMPOSED OF RUNDLES. F—CURVED
 ROUND IRONS. G—ROWS OF PUMPS.



A—WHEEL. B—AXLE. C—JOURNALS. D—PILLOWS. E—DRUM. F—CLAMPS.
 G—DRAWING-CHAIN. H—TIMBERS. I—BALLS. K—PIPE. L—RACE OF STREAM.



A—AXLES. B—WHEEL WHICH IS TURNED BY TREADING. C—TOOTHED WHEEL.
 D—DRUM MADE OF RUNDLES. E—DRUM TO WHICH ARE FIXED IRON CLAMPS.
 F—SECOND WHEEL. G—BALLS.