

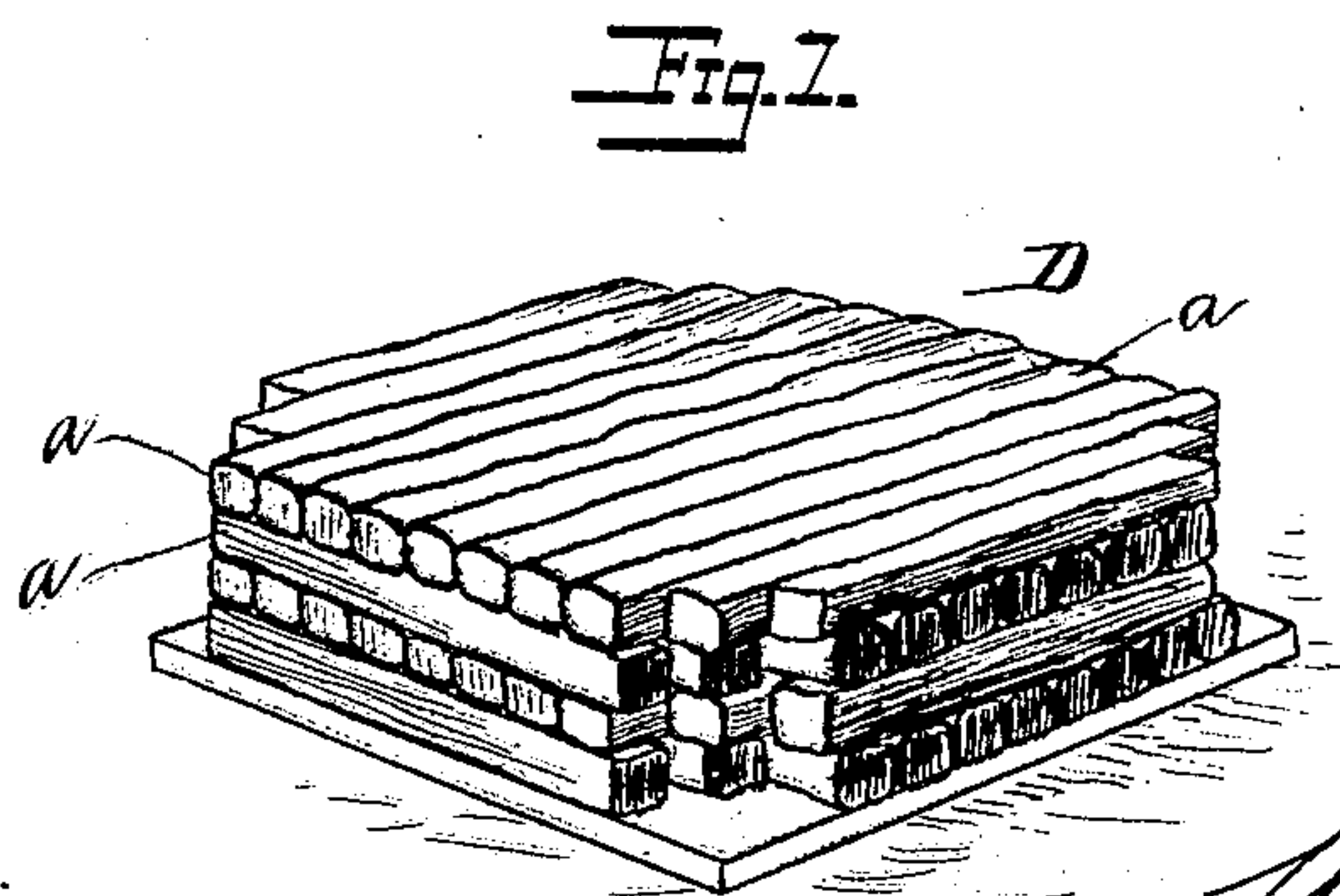
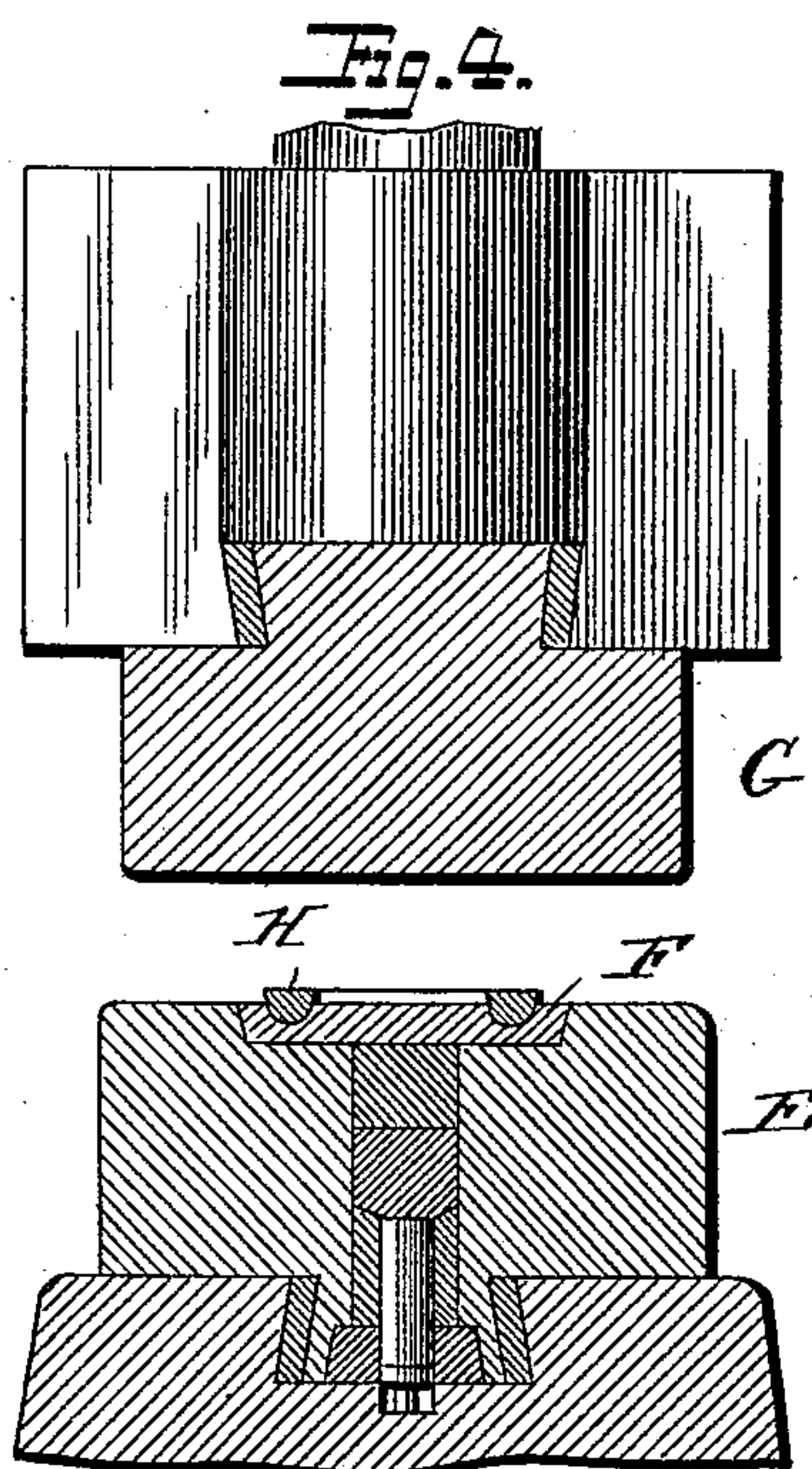
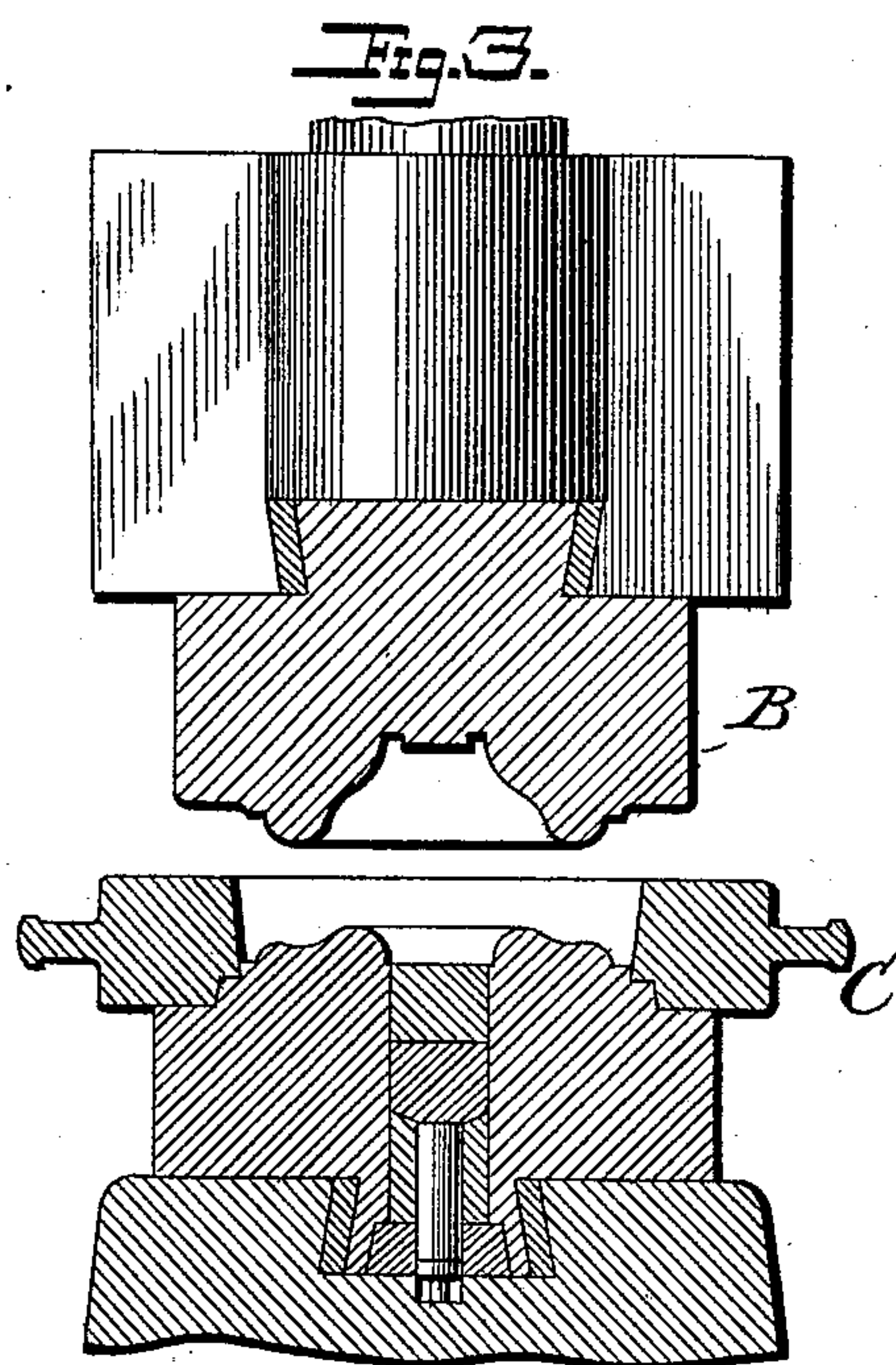
(No Model.)

2 Sheets—Sheet 1.

W. A. PEARSON.  
METHOD OF MAKING CAR WHEELS.

No. 521,321.

Patented June 12, 1894.



Witnesses  
J. G. Hinkel.  
Robert Watson

Inventor  
W. A. Pearson  
By J. M. Watson Attorney

(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

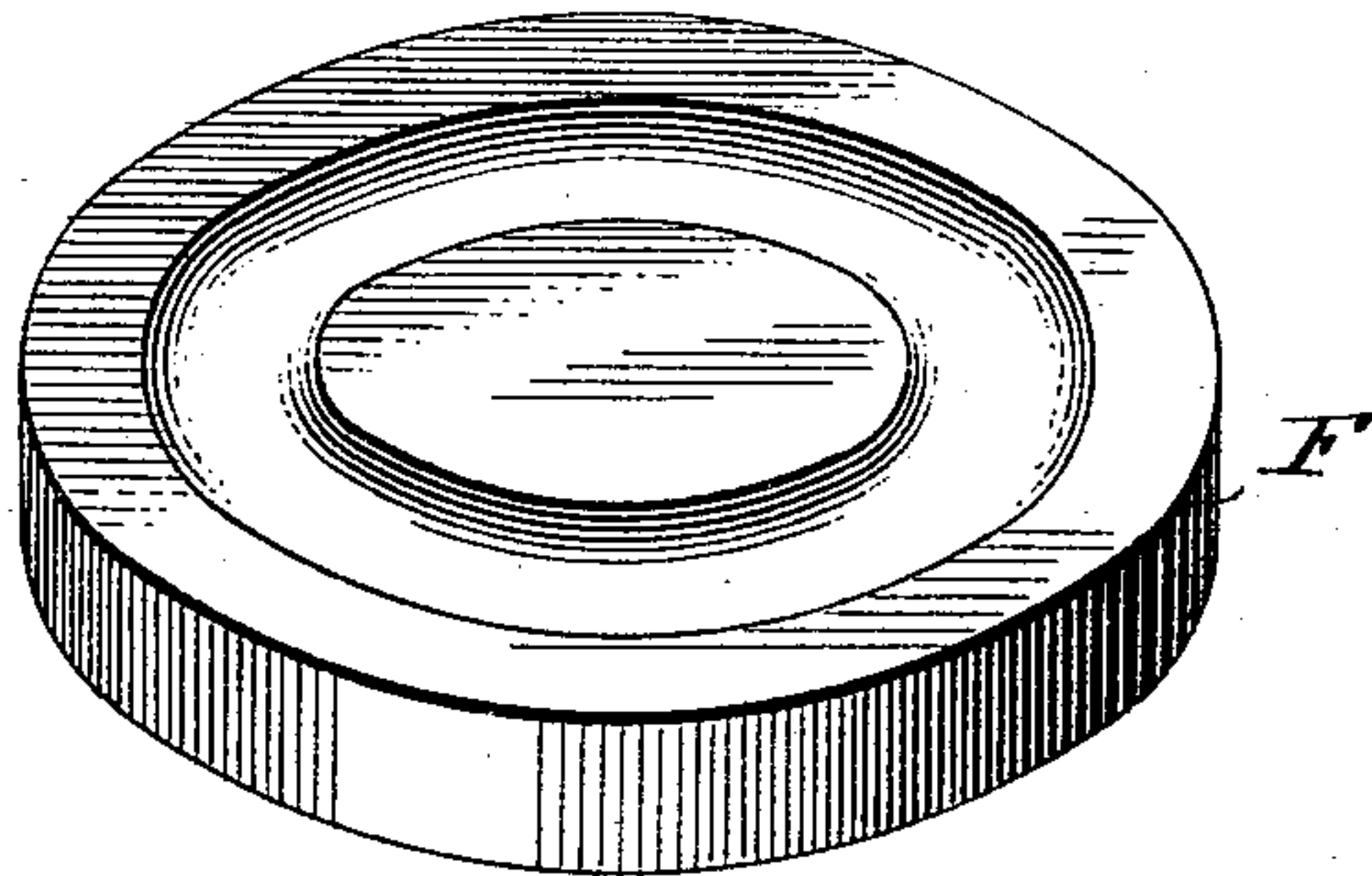


Fig. 6.

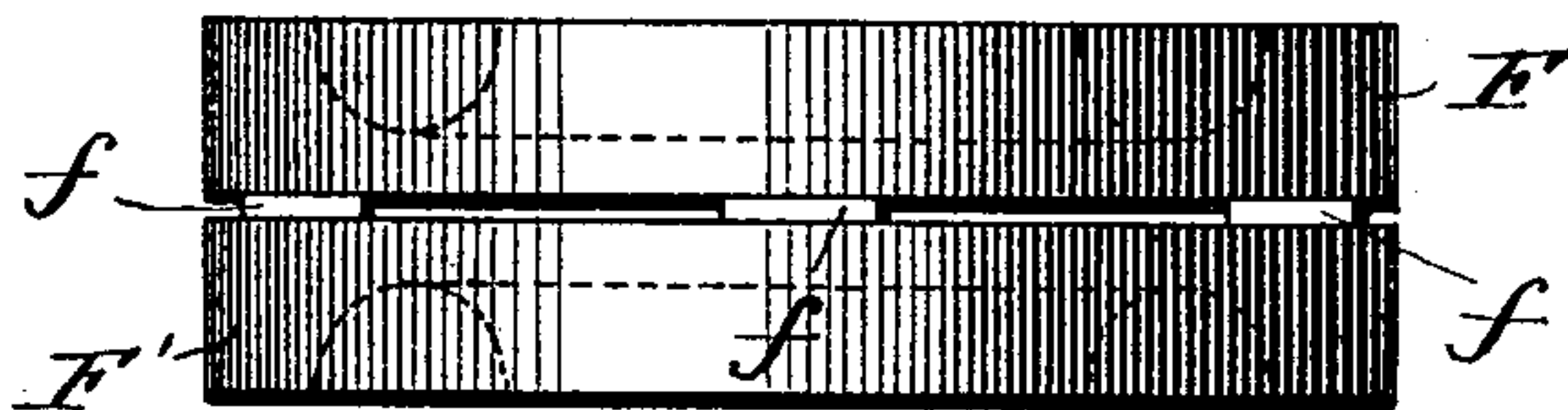


Fig. 7.

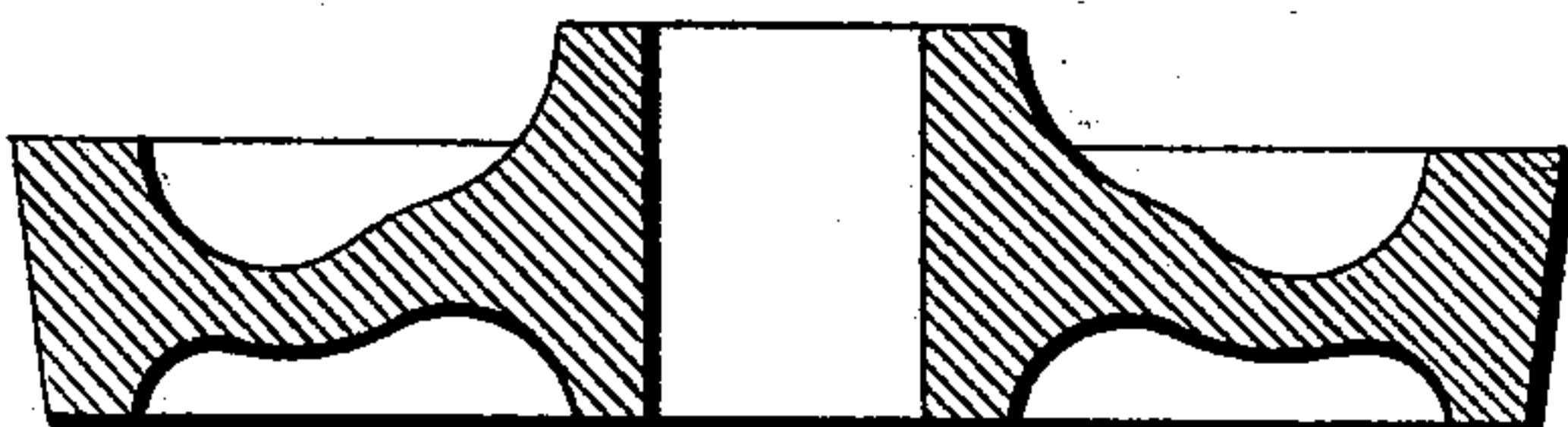
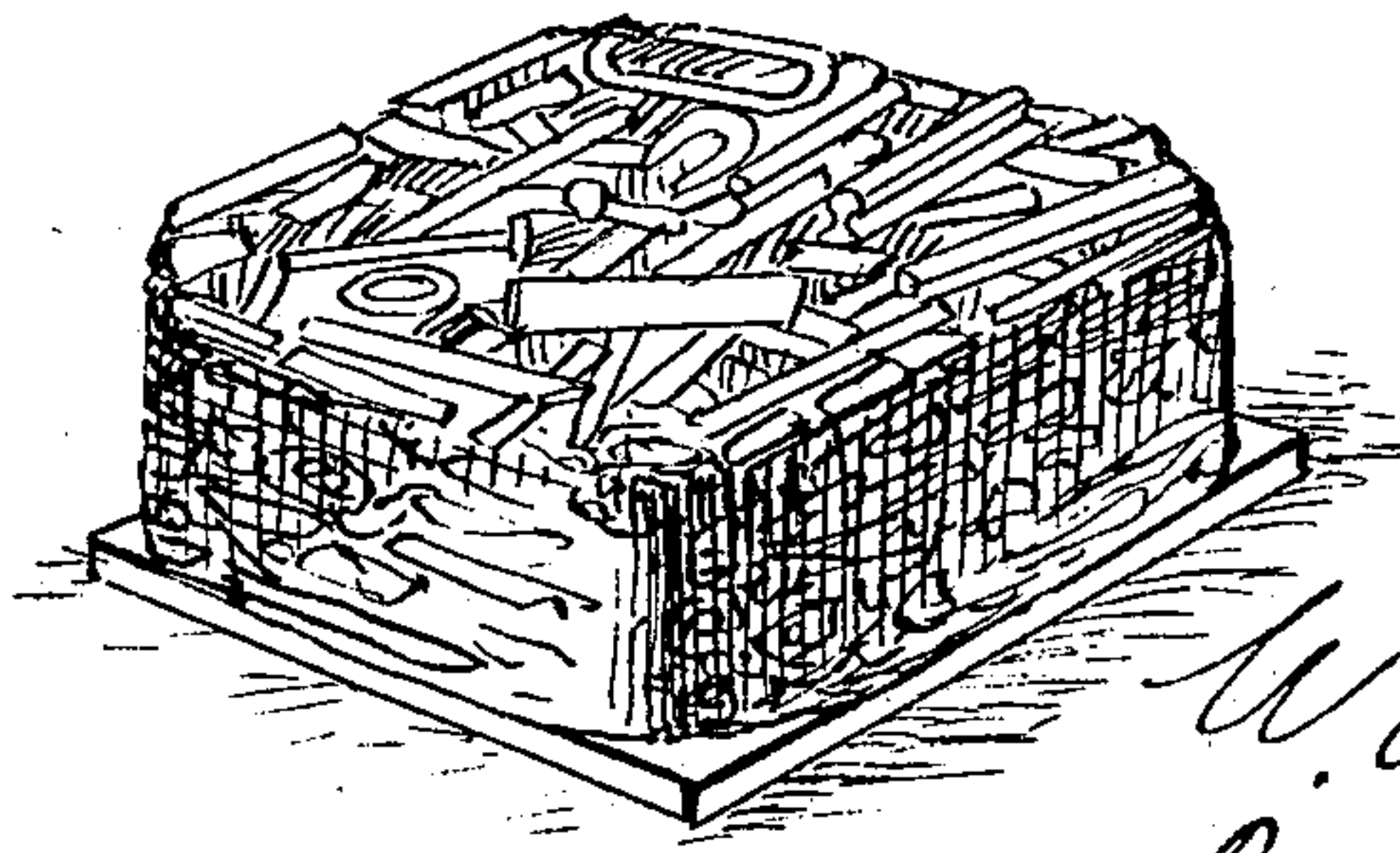


Fig. 8.



Witnesses  
*J. G. Hinkel*

*Robert Watson*

Inventor

*W. A. Pearson*  
By *J. M. Watson*  
Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM A. PEARSON, OF SCHENECTADY, NEW YORK.

## METHOD OF MAKING CAR-WHEELS.

SPECIFICATION forming part of Letters Patent No. 521,321, dated June 12, 1894.

Application filed December 8, 1893. Serial No. 493,184. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM A. PEARSON, a citizen of the United States, residing at Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in Methods of Making Car-Wheels, of which the following is a specification.

My invention relates to improvements in the manufacture of car wheels and wheel centers, and it consists in a new method of manufacturing such articles from wrought metal, such as iron or steel.

In carrying out my improved process in one form I use piles or billets built up of several layers of muck bars one above the other, with the bars of each layer running across those of the adjacent layers, and preferably at right angles thereto. Each pile contains sufficient material to make one half of the desired wheel or center. I then heat the compound billet thus formed, and by the use of dies produce a rough blank for a half-wheel, preferably having a groove in one side corresponding roughly to the web of the wheel. Two of these blanks are afterward placed back to back, preferably separated by two or more extra bars and reheated, after which the complete wheel or center is formed in finishing dies, such for instance, as those described in my patent. The half wheel blanks are often imperfect from lack of sufficient metal to fill out the edges to the required size. When this is the case, the defect is remedied by placing between the half-blanks sufficient metal to fill the vacancies and arranging the extra pieces at the proper points, so that in the subsequent forging operation they will be in position to fill the gaps.

In another form of my invention, I make up the billet by piling irregular pieces of scrap and muck bar in such a manner that when forged the resulting blank or wheel will have its fibers interwoven and thoroughly knitted together. A wheel thus formed is practically indestructible. If there are any flaws due to imperfect welding, they cannot spread so as to endanger the wheel, and its internal physical structure prevents rupture or crystallization under the severe and varied shocks and strains to which car wheels are ordinarily subjected. These interwoven and

matted billets may be forged in a single series of operations into complete wheels, but I prefer to make them into half-blanks and reheat and unite said blanks in pairs as above described.

I rather prefer to form the half-blanks scant and to fill out by means of extra pieces interposed as above described, for the reason that I am thus enabled to distribute the metal properly for the final forging. By other methods of forging wheels, if there is a deficiency of metal at one point of the billet, and an excess at another, it requires a great deal of force to press the metal from one part of the blank to the other, and a consequent consumption of power and strain upon the machinery. By my improvement above described the metal to make up any deficiency is placed at the proper points and in proper quantity so that when the dies are brought together they have only to shape the wheel and are not required to force metal from one part of the blank to another.

My improved process will be more fully described in connection with the accompanying drawings, in which—

Figure 1 is a perspective view of a pile of scrap or muck bars for a half-wheel blank. Fig. 2 is a perspective view of a pile formed of irregular scrap. Fig. 3 is a section of finishing dies for completing a wheel. Fig. 4 is a sectional view of dies for forming the half-wheel blanks. Fig. 5 is a view of a finished half-blank. Fig. 6 is a side view of two half blanks in position for reheating, and Fig. 7 is a perspective view of a finished wheel.

Referring to Fig. 1, D represents a pile of bars composed of layers *a a*, &c., the bars of adjacent layers being arranged to cross each other, and the total amount of metal being sufficient to form a half wheel-center or wheel. Fig. 2 shows a pile of the same size, but formed of irregular scrap or scrap and bars mixed.

I prefer a billet built up as illustrated in Fig. 2, for the reason that the fiber in the resulting wheel is more intimately interwoven and matted than where the bars are simply laid in layers, and such a wheel is better adapted to withstand the strains and shocks to which car wheels are usually subjected without being weakened or crystallized.



The piles of scrap and bar above described, when suitably heated, are placed in a die E and formed into half wheel blanks F by a forging hammer G. The half wheel blanks 5 are roughly shaped to conform to their respective portions of the finished wheel. Thus, for a plain wheel I form an annular groove in each blank F to assist in finally developing the web of the wheel. This may be done by 10 placing a ring H upon the blank during the process of forging. If the finished wheel is to have a corrugated web I form the half-blanks accordingly with rough or partial corrugations. I next take these blanks F F' 15 and arrange them in pairs, back to back, and separated by two or more bars or pieces of scrap f. The pairs of half-blanks are weighed and any deficiencies of weight or irregularities in form are filled out by adding suitable 20 amounts of scrap or bar at the proper points, preferably between the half blanks. The pair of half blanks, as shown in Fig. 6, is then placed in a furnace and brought up to bleeding heat, a slight bleeding is allowed between the two inside surfaces, and they are 25 then turned over on the other face and the flux is allowed to flow in the opposite direction, and when they are then submitted to the pressure of the dies the half-blanks become thoroughly united, making the whole 30 wheel an interlaced mat of fibers. The re-

sulting wheel will consist of a solid mass of flattened layers of metal, the grain of each layer crossing the grain or fiber of the adjacent layers. A wheel thus formed cannot 35 split in any direction, and any flaws from imperfect weld will not spread, as a crack which tends to spread would be stopped by the fiber of adjacent portions of the wheel running transversely to its direction. 40

What I claim, and desire to secure by Letters Patent, is—

The method of making car wheels and car wheel centers which consists in forming billets of scrap or bars, the pieces being arranged so that their fiber is interwoven or 45 matted, heating said billets to a welding temperature, forging said billets into half wheel blanks, placing said blanks back to back in pairs, with pieces of metal interposed to permit of proper heating and compensate for 50 deficiencies in the blanks, and then reheating said pairs of blanks and forging them into finished wheels or wheel centers in suitable dies, substantially as described. 55

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM A. PEARSON.

Witnesses:

ALBERT B. HERRICK,  
E. ATTENPOHL.