

Feb. 24, 1953

A. CROES
SHUTTLE

2,629,406

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2 SHEETS--SHEET 1

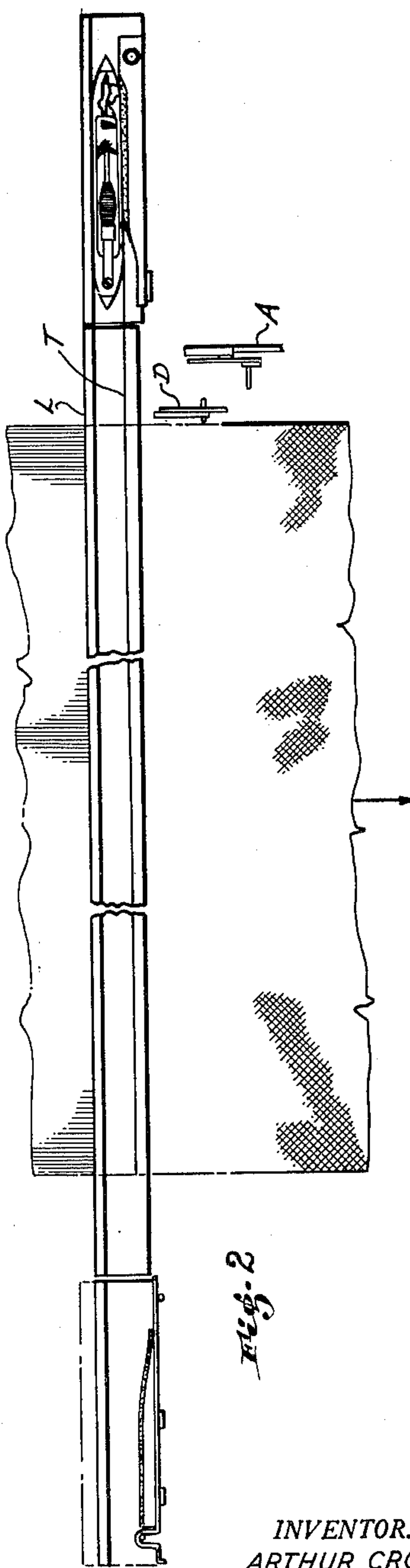
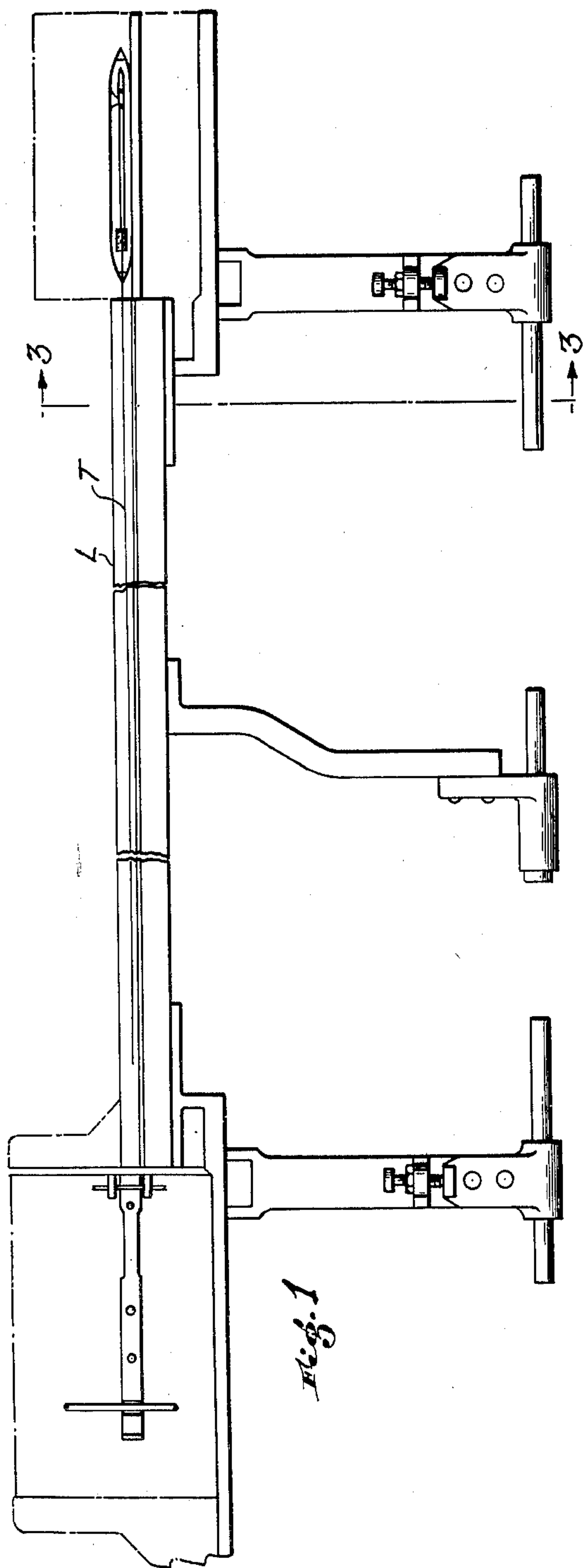


Fig. 2

INVENTOR.
ARTHUR CROES

BY

F. J. LeHalle

Attorney

Feb. 24, 1953

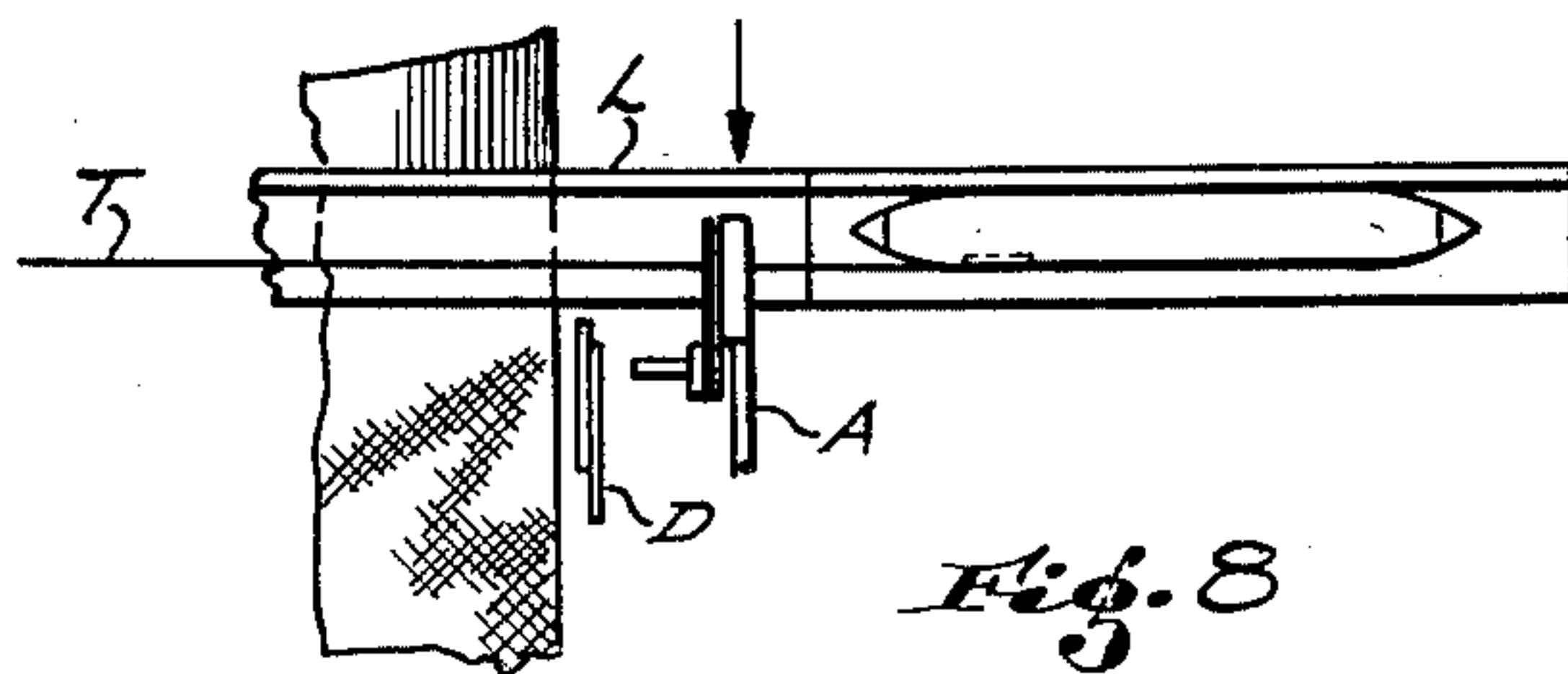
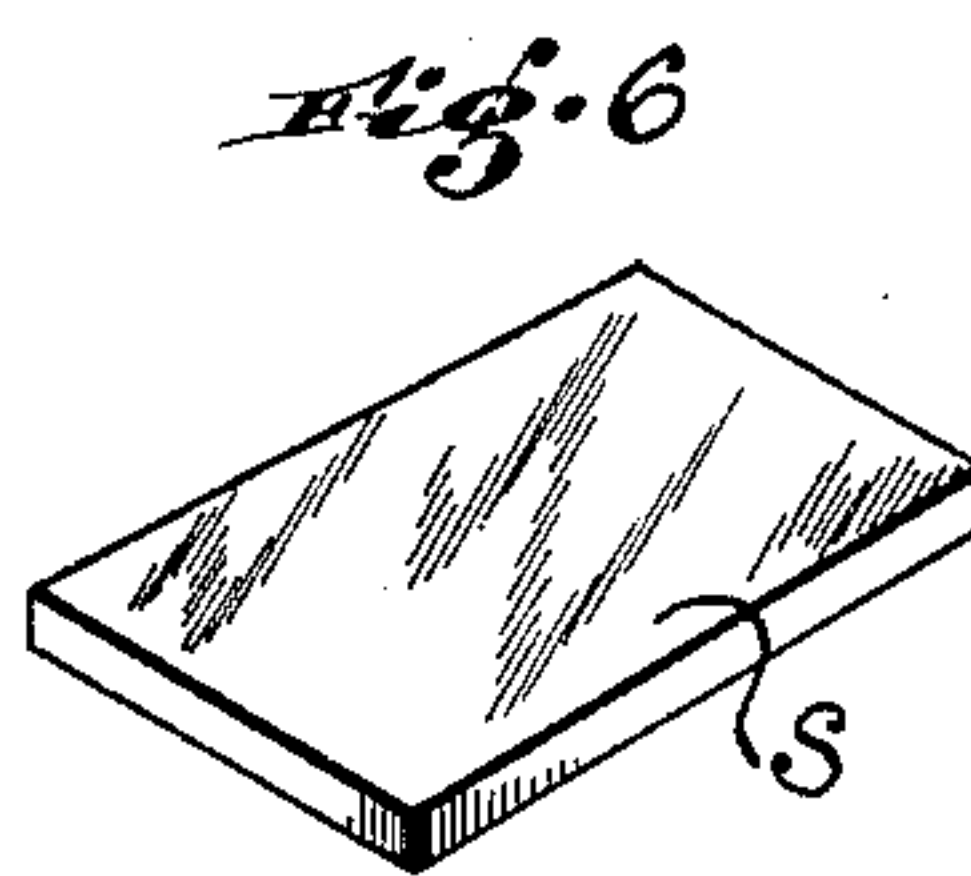
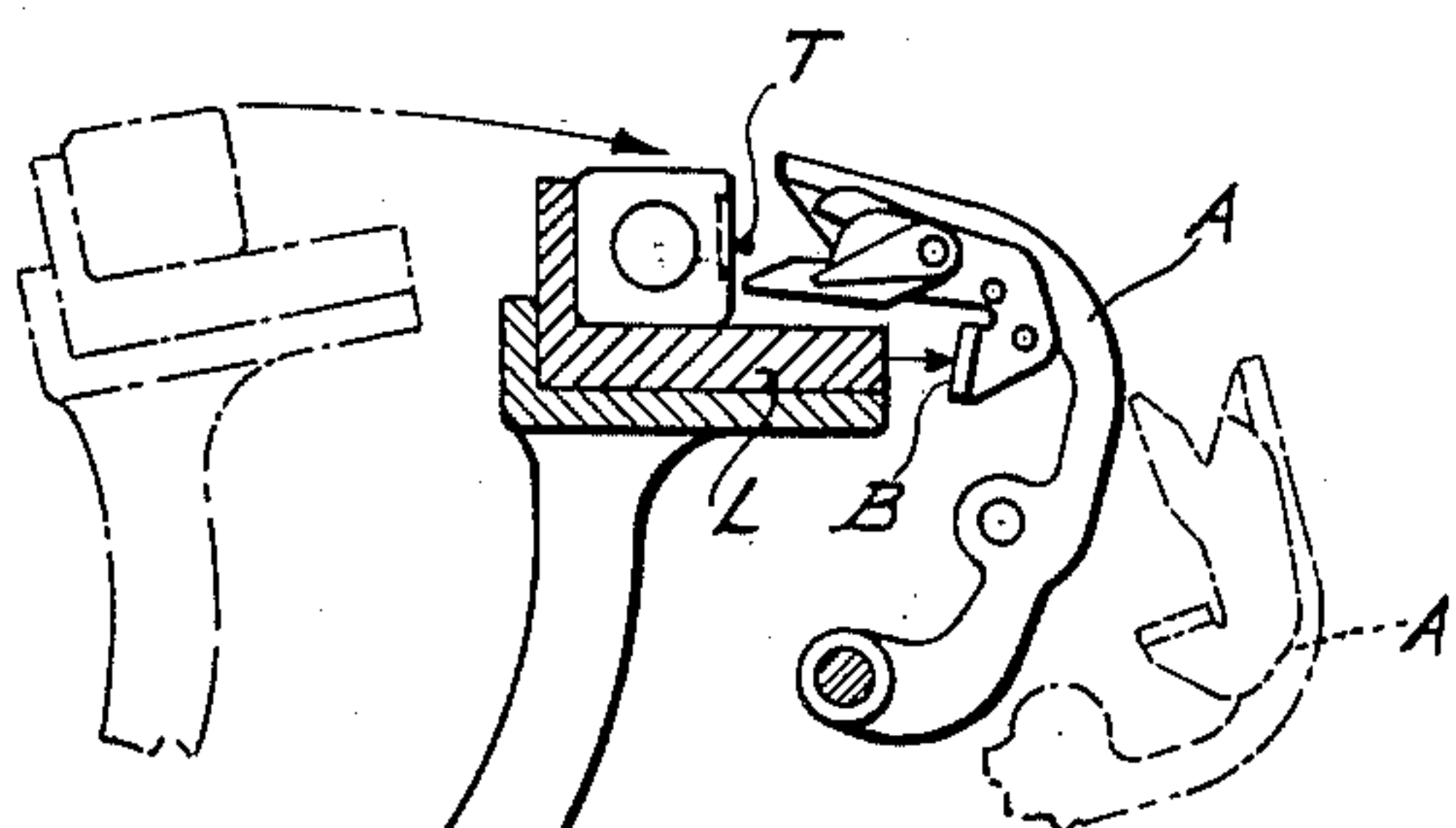
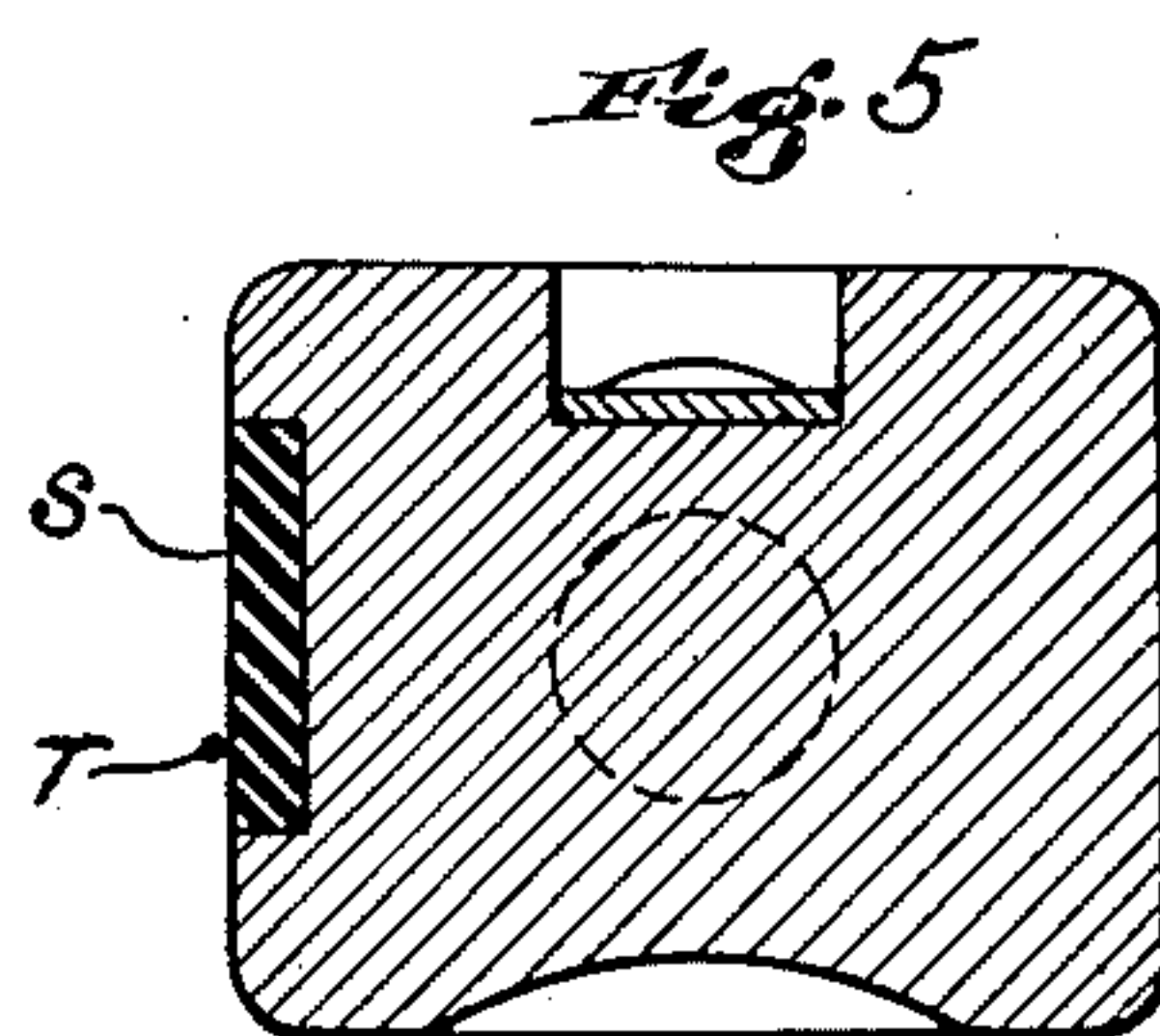
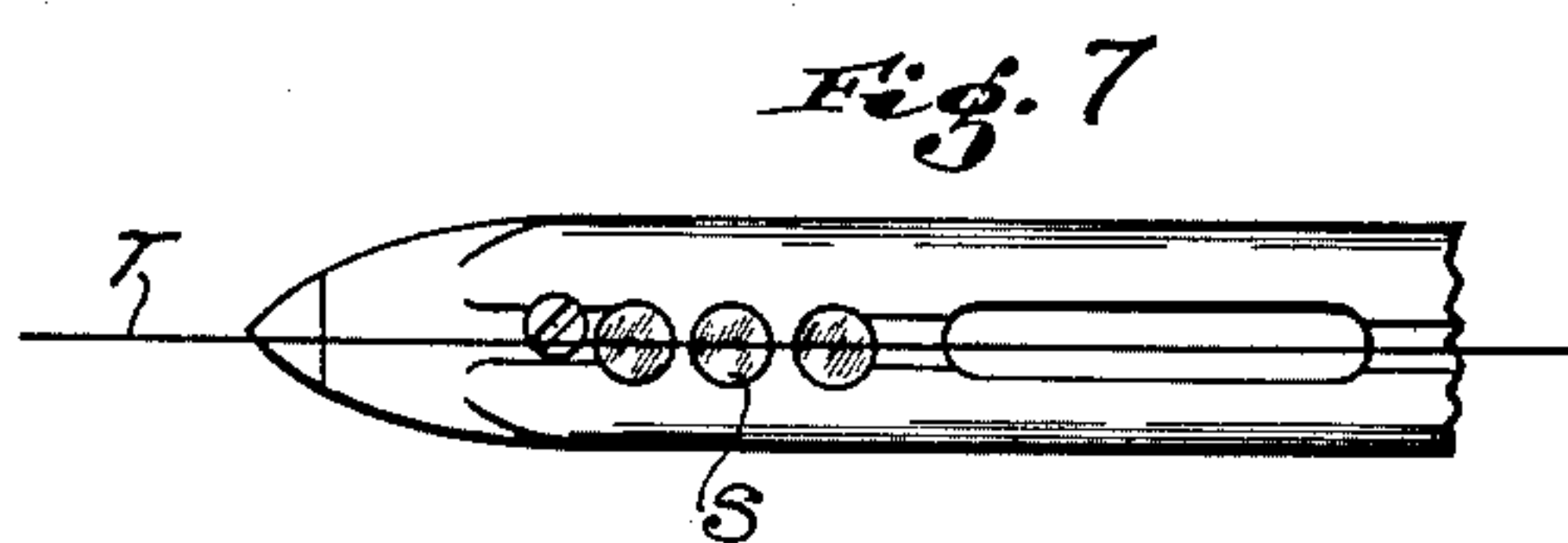
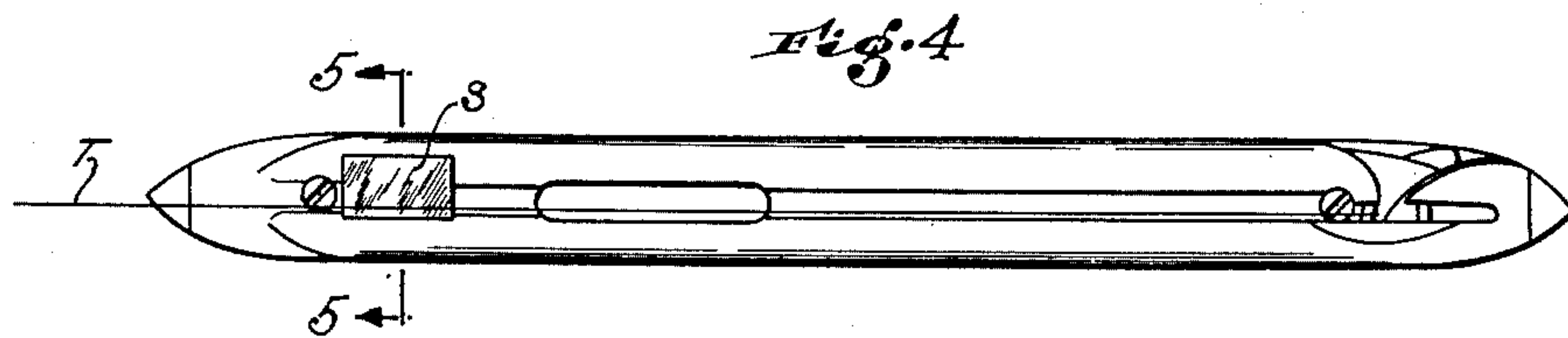
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SHUTTLE

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2 SHEETS—SHEET 2



INVENTOR.
ARTHUR CROES

BY

E. J. LeMaster
Attorney

UNITED STATES PATENT OFFICE

2,629,406

SHUTTLE

Arthur Croes, Lawrence, Mass., assignor to Pacific Mills, Lawrence, Mass., a corporation of Massachusetts

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1 Claim. (Cl. 139—196)

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This invention relates to an improved shuttle and its object is to eliminate the carrying of loose pieces and ends of thread into the cloth which would produce defects in the cloth.

With a shuttle which contains a bobbin, such as in the automatic bobbin changing loom, the thread on the bobbin is exhausted until there are only a few turns of thread on the bobbin. The filling detector feels this deficiency of thread on the bobbin and sets in operation mechanism which causes a transfer of a fresh bobbin into the shuttle which drives out the spent bobbin from the shuttle, all as is well known in the art.

When the transfer takes place, with the shuttle in the right-hand box, i. e. on the bobbin transfer side of the loom, then a piece of thread from the spent shuttle may lie on the lay from the shuttle eye to the front part of the shuttle box, and will roll under the front part of the shuttle. When the transfer takes place, the pressure on the shuttle traps this piece of filling thus preventing it from following the exhausted bobbin. The shuttle then carries the short piece of filling into the cloth to cause the defect known as a "flyer." This happens quite frequently and the weaver watches for it, and when a flyer is formed in the cloth, he is supposed to see it and pull it out. But if he fails to do this, the flyer causes a defect in the cloth.

Just before the bobbin is changed, the detector feels the lack of thread on the bobbin and causes the operation of mechanism which lifts up the thread holder and cutter so that as the lay beats up, the thread from the spent bobbin should enter the jaws of the thread holder and cutter and be thereby cut. Then a second cutter near the selvage of the cloth is operated by the impact of the lay to cut the thread close to the selvage. The holder holds the filling until this second cutter cuts it. But if the thread from the spent shuttle is slack, it may drop down onto the lay and out of position so that it will not enter the cutting jaws of the holder and cutter and not be cut or seized by the holder. Then, the transfer having taken place, the spent bobbin falls down and in so doing breaks the thread leaving a part of it lying on the lay and part in the shuttle. The picked shuttle carries the piece of filling into the cloth to cause a so-called "filling runner."

Another cause of defects in the cloth is due to the rebound of the shuttle, even slightly, in the right-hand box. This causes the thread to become slack between the shuttle eye and the sel-

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vage and the slack may fall down on the lay. Then, as the shuttle is picked from right to left, the thread may get under the left-hand bottom of the shuttle, which cuts the thread and is the cause of "broken picks," and much loss of time in efforts by the loom fixer to correct the condition.

In accordance with my invention the shuttle is equipped with a static insert made of hard rubber or other suitable material on the side of the shuttle remote from its eye. I have discovered that this insert becomes charged with static electricity as the shuttle is picked across the loom.

The result is that when there is a thread which lies against the side of the shuttle from its eye to the other end of the shuttle, as it boxes on the right-hand side, this thread is held against the static insert by the effect of the static electricity, and is thereby prevented from falling down onto the lay between the static insert and the eye at the right-hand end of the shuttle. Such little slack as there may be between the static insert and the selvage is so small that it can do no harm. The thread cannot get under the bottom of the shuttle at its left-hand end.

Consequently, by my invention the thread is held up between the static insert and the selvage so that the thread enters the jaws of the thread holder and cutter as the lay beats up and is cut at that point.

When the fresh bobbin is inserted, the static insert still holds the thread and as the spent bobbin is forced down and out of the shuttle, the thread is stripped off the static insert and is carried away with the spent bobbin.

In the drawings,

Fig. 1 is an elevation of the lay with the shuttle in the right-hand box;

Fig. 2 is a plan view of the same;

Fig. 3 is an elevation and cross section of a part of the lay with the shuttle in the right-hand box;

Fig. 4 is a side view of the shuttle with the thread extending from its eye at the right-hand end to the left-hand end;

Fig. 5 is a cross section of the shuttle on the line 5—5 of Fig. 4;

Fig. 6 is a perspective view of a static insert;

Fig. 7 is a view of the left-hand end of the shuttle with another form of a static insert; and

Fig. 8 is a plan view of the right-hand end of the lay with the shuttle in the box.

The loom is an automatic bobbin changing loom of a well known type.

When, during the operation of the loom, the

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detector (not shown) of a well known type detects the almost complete absence of filling on the bobbin, well known mechanism is set into operation to force a fresh bobbin down into the shuttle on top of the spent bobbin and eject the latter down and out of the shuttle and at the same time cause the operation of mechanism which moves the thread holder and cutter A from its dotted line position to its full line position, Fig. 3. In normal operation the thread T from the shuttle lies in a straight line from the shuttle eye to the selvage of the cloth and in this position it lies opposite the jaws of the holder and cutter A. Then as the lay L beats up, it strikes a projection B on one of the cutter blades thereby perating it to cut the thread which has been brought between those blades by the beat up of the lay in the direction of the arrow, Fig. 3, and to hold the cut end of the part which is woven into the cloth. To the left of the holder and cutter A is another thread cutter D shown in Fig. 8 which cuts the thread close to the selvage when the thread holder and cutter A returns to its dotted line position, Fig. 3. These parts are all well known in the art and need no further description.

As above stated, I have found that as the shuttle is picked from side to side, a charge of static electricity is created on the static insert S so that, when the shuttle enters the right-hand box, this charge causes the thread T to be held against the static insert in the wall of the shuttle thereby holding the thread up from the static insert to the selvage of the cloth and also from the static insert to the eye of the shuttle. Thus when the filling detector has called for a change of bobbin and lifted the thread holder and cutter A to its full line position, the effect of the static insert in holding the thread up assures that the thread will be carried into the jaws of the thread holder and cutter by the forward movement of the lay and properly held and cut by holder and cutter A and cutter D.

When the spent bobbin is ejected from the shuttle, it carries its end of the thread with it so that there is no danger of this part of the thread being carried back into the cloth.

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Because the thread is held against the static insert by the electric charge therein, the possibilities of the other end of the thread being carried into the cloth and causing defects therein are eliminated because,

(1) When the transfer of bobbin takes place the piece of thread from the spent bobbin and extending out of the shuttle eye is held up above the lay and is cut by the holder and cutter A and the end from the spent bobbin is carried away as that bobbin drops down and the holder and cutter is swung down to the dotted line position, Fig. 3, thereby carrying the thread which extends from the holder and cutter to the selvage into the jaws of the cutter D.

(2) If the shuttle should rebound in the right-hand box, the slack of the thread is held up above the lay by the static insert and there is no opportunity for the shuttle to carry the thread into the cloth.

The static insert may be made of any suitable material which will be charged with static electricity by the picking of the shuttle. I have found that a piece of hard rubber operates well and performs the described functions. The insert need not be made in one piece as shown in Fig. 6, but it might be made of several pieces circular in form as shown in Fig. 7 or of other shapes.

I claim:

A loom shuttle having in its side near its end remote from its eye an insert of material capable of being charged with static electricity as the shuttle is thrown across the loom, said insert being surrounded on the exposed face of the shuttle by material substantially less capable of acquiring a static electric charge.

ARTHUR CROES.

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The following references are of record in the file of this patent:

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